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ABSTRACT

This first of three volumes summarizes the activities and results of a survey of environmental education conducted for the Office of Environmental Education, U.S. Office of Education. The document presents a discussion of critical themes for environmental education; historical perspectives of environmental education; and future themes for environmental education. Attention is given to the methodology and results of a national survey of natural-environment-based education activities. Further discussion deals with interpretation of the Environmental Education Act of 1970 including the design of a survey instrument to collect data on interactions in environmental education. Concluding discussions cover the need to develop core themes in environmental education. Schematic models of various concepts and interrelationships are presented. Appendixes present copies of survey instruments, comments on survey instruments, and a bibliography. (RE)

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CENTER FOR ENVIRONMENTAL STUDIES

ARIZONA STATE UNIVERSITY

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ASSOCIATION OF AMERICAN GEOGRAPHERS

U.S. DEPARTMENT OF HEALTH,
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ENVIRONMENT-BASED ENVIRONMENTAL EDUCATION: INVENTORY, ANALYSIS, AND RECOMMENDATIONS

Final Report
of the
Environment-Based Education Project

Prepared for:
DIVISION OF TECHNOLOGY AND ENVIRONMENTAL EDUCATION
UNITED STATES OFFICE OF EDUCATION
Contract No. OEC - 74-8739

30 June 1975

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PREFACE

This report presents the results of the Arizona State University/ Association of American Geographers Environment-Based Education Project under Office of Education Contract OEC-73-8739. The report consists of three Volumes. This volume (Volume I) is a shorter summary of the Project activities and results. Volume II is the long and detailed manuscript divided into four parts: (1) Introduction, Perspectives, and Themes; (2) Inventory and Assessment of Environmental Education: A National Sample; (3) Models and Methodologies associated with the Environmental Education Act; and (4) Recommendations and Conclusions. Volume III is a series of appendices which include: (1) all bibliographic sources used by the Project; (2) listings of all organizations, agencies, programs, etc. who were contacted and/or responded to Project solicitations; (3) pertinent questionnaire data sources; and (4) other pertinent research data. Volumes II and III present the majority of detail involved in the one-year project.

Background and Objectives of the Project

In 1970, the Senate and House of Representatives of the United States enacted Public Law 91-516. This legislation created the "Environmental Education Act" which was amended by Public Law 93-278 in 1974. The Act authorized the United States Commissioner of Education to establish education programs to encourage understanding of policies, and support of activities, designed to enhance environmental quality and maintain ecological balance, while giving due consideration to the economic considerations related thereto.

The Act provided for the establishment of an office of environmental education within the Office of Education to support nonprofit agencies for research, demonstration, and pilot projects designed to educate the public on the problems of environmental quality and ecological balance. It included the development of curricula, dissemination of information relating to such curricula, support for environmental education programs at the elementary and secondary education levels, preservice and inservice training programs for educational personnel, planning of outdoor ecological study centers, community education programs, and preparation and distribution of materials suitable for use by the mass media.

In the spring of 1974, the Division of Technology and Environmental Education, U.S. Office of Education, distributed a Solicitation (RFP 74-50). The Solicitation called for the design, development and preparation of a report on natural environment-based education activities, and environmental education. The purposes, goals and requirements of Attachment A of the Solicitation called for reports involving educational philosophy and pedagogy; subject matter and content of existing environment-based programs as these relate to environmental education as defined by the Act and related documents; social, economic, political, and physical considerations as well as a diversity of age and training levels. Further, it asked for identification of those approaches which might be adapted to best fulfill the scope and purpose of the Environment Education Act.

In response to Solicitation RFP 74-50, the Arizona State University Center for Environmental Studies in conjunction with the Association of American Geographers submitted a proposal, subsequently approved, in April, 1974 to make a selective inventory and analysis of existing natural environment-based educational programs and activities. The proposal provided for a management and research team to interpret environmental education needs and/or programs in the context of multi-dimensional spectra including educational philosophy and pedagogy; disciplinary, interdisciplinary, cross-disciplinary, and multidisciplinary bases; organizational and institutional structures; relationship to the Environmental Education Act (Public Laws 91-516 and 93-278); and age and educational levels of the population.

Research Design

The overall research design was formulated and carried out by the Principal Investigators, four Task Force Leaders (elementary education, secondary education, college and university, and nonformal outdoor-oriented education), and a Steering Committee of nine members. Consultants were used as required. The composition of these groups represents a wide range of disciplines concerned with environment-based education. Further, the members of the management and research team reflect expertise in educational levels from the elementary school to university graduate levels.

It was recognized that within the time and budget constraints of the project that a comprehensive quantitative testing program could not be carried out, and that assessment, while based on hard data, must include value judgments on the part of the project personnel and the Steering Committee.

Research and writing was accomplished during an 11-month period (August 1974-June 1975). The specific tasks of the research included: (1) historical and current perspectives and themes of the environmental movement and environment-based education; (2) the acquisition of materials and assessment of existing environmental education programs from a national sample; (3) development of a survey instrument to assess existing environmental education and its relationship to the Environmental Education Act of 1970 and amendments; (4) implementation of the survey instrument in an Arizona case study; (5) an interpretation of the national and local surveys in environmental education, leading to conclusions and recommendations; and (6) the development of core themes and related systems model concerned with the broader aspects of environmental education.

Chapter 1 of this volume summarizes results of the research, particularly in terms of conclusions and recommendations. The remaining chapters essentially follow the logic of the research described above.

Research Perimeters

The specific research design and methods of investigation were defined by the Steering Committee, Task Force Leaders and Principal Investigators at several joint meetings held during the early stages of the project. It was determined that the research matrix would be national in scope and would include the inventory of existing programs--elementary school, secondary school, college and university, and outdoor-oriented programs. The research structure would also include the assessment of existing programs and the statement of meaningful recommendations, with evidence to support them, for future action. Further, the study would be interdisciplinary in scope involving several academic disciplines, government agencies, private industry, and citizen-interest groups.

Within the definition of environmental education (developed in Chapter 2), it was recognized that citizens are constituents and consumers--some are environmental professionals. The values and orientation of the citizenry should be affected to a level that it stimulates their will to act. The research should, therefore, include realms of both citizen constituents and professional constituents. Further, environmental education must deal not only with materials and programs, but also with the delivery system; that is, the full variety of pedagogic and communication systems should be considered in this research.

Project Personnel

The Principal Investigators associated with Arizona State University were Melvin G. Marcus (Project Chairman) Professor of Geography and Director, Center of Environmental Studies; John F. Lounsbury (Project Director) Professor of Geography and Chairperson, Department of Geography; and Richard D. Britz (Project System Design Director) Assistant Professor of Landscape Architecture and Planning. Salvatore J. Natoli (Associate Project Director) is the Director of Educational Affairs, Association of American Geographers.

The Task Force Leaders were William L. Christen (Secondary School Task Force) Staff Development Specialist, Mesa Arizona Public School System; Richard D. Hecock (College and University Task Force) Professor of Geography, Oklahoma State University; Robert C. Mings (Outdoor-Oriented Education Task Force) Associate Professor of Geography, Arizona State University; John E. Steinbrink (Elementary School Task Force) Assistant Professor of Geography, University of Houston at Clear Lake City.

The members of the Steering Committee were Barry C. Bishop, Editorial and Research Staffs, National Geographic Society; Mark F. Ferber, President's Panel on Bio-Medical and Behavioral Research (Formerly Director, Educational Affairs, American Political Science Association); John B. Garver, Director, Earth, Space and Graphic Science Department, U. S. Military Academy; Dennis

Hanson, National Wildlife Federation, Editor of Conservation News, and National Wildlife Federation Media Liaison; J. Thomas Hastings, Director, Center for Instructional Research and Curriculum Evaluation, University of Illinois; Thomas Owen, District Manager and Environmental Education Expert, Grand Junction, Colorado District Office, Bureau of Land Management, United States Department of Interior; Duncan T. Patten, Assistant Vice President of Academic Affairs and Professor of Botany, Arizona State University; Forest Stearns, Professor of Botany and Chairman, Department of Botany, University of Wisconsin, Milwaukee; Officer, Ecological Society of America and former editor of Ecology; and Robert Stonoff, Chairman, Arizona State Department of Education, Task Force for Environmental Education. Head, Science Department, East High School, Phoenix, Arizona.

Invaluable assistance was received from Robert Ferber and Matthew Hauck, Survey Research Laboratory, University of Illinois, in developing the Environmental Education Survey Questionnaire; and from Carolyn D. Spatta, who served as a consultant to the overall project.

Much of the difficult task of acquiring and compiling the raw data fell on the capable shoulders of Daniel P. Aiello, E. Ruth Bajza, Brent H. Belknap, Reynold C. DuBois, and Duane L. Stormont, Arizona State University, who served in the capacity of Graduate Research Assistants.

Several individuals normally associated with Center for Environmental Studies, Arizona State University but involved with the Project's activities from time to time, included Eugenia A. Hodenpel and Barbara A. Smith, Secretaries, Gary L. Bowen, Linn B. Hanson, Keith W. Scoular, and Norman L. Weiss, Interns. These individuals gave freely of their time and rendered invaluable assistance.

Last, but certainly not least, the Project's work would not have been accomplished without the dedication demonstrated by the Project's secretaries, Marcia E. Holberton and Diana L. Jeter, who were with the Project from essentially the beginning to the end, and Barbara A. Britz and Stephan A. Boruchowitz who were with the Project in its early stages.

Tempe, Arizona
June 30, 1975

VOLUME I

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CHAPTER 1

ENVIRONMENTAL EDUCATION: CRITICAL THEMES FOR THE FUTURE

Environmental education in the United States is at a critical juncture. A major period of environmental awareness and concern may be moving into its waning stages. Historical precedent reveals a cyclical nature to environmental movements: a decade of intense activity followed by a generation of quiescence, and sometimes reaction. But even during dormant stages, significant innovations are sustained and integrated into the fabric of the American scene. Many of the environmental accomplishments of the early 1900's and 1930's, for example, are now intrinsic parts of the nation's legal, political, and socioeconomic framework.

The curve of the recent environmental movement has peaked and begun its descent. Environmental education, a significant product of the movement, will either follow downslope or be one of the components which maintains its momentum and position. Which path it follows will depend on the planning, programs, and priorities established in the next few years and the public's acceptance of them.

The Environment-Based Education Project has been an attempt to identify and interpret the critical criteria involved in this decision-making process. Utilizing a sampled national inventory, a detailed study in one state, and a large body of information and opinions taken from the historical record, environmental education literature, interviews, letters, and conferences—the Project has developed a data base, conclusions, and recommendations that will hopefully provide insights into the status and future of environmental education in the United States.

This chapter presents conclusions and recommendations drawn from this one-year study of environmental education. Three types of sources provide the data and other evidence on which the conclusions and recommendations are based. Firstly, there is information taken from the sampled national inventory and analysis. Secondly, statistical information is available from the Arizona Survey. Thirdly, there is a body of information and opinions taken from other aspects of the research, such as the historical record, environmental education literature, interviews and letters, and conferences. The background and context of these sources is provided in following chapters which summarize methodology, data collection, analyses, and interpretations.

The remainder of this chapter is divided into two parts: (1) a series of conclusions and recommendations derived from the study, and (2) a description of the rationale and methods of the project, which are articulated in the subsequent six chapters of Volume I of this report.

Recommendations

The recommendations for environmental education are presented as one primary or overriding recommendation and several related secondary or supporting recommendations. It must be recognized that many of the recommendations are intended to fill gaps or weak areas in existing environmental education; thus, less attention is given to the already well represented and often successful areas of environmental education. This is particularly true for the natural and physical sciences.

The primary recommendations and the supporting secondary recommendations listed below are suggested for the support of the goals and principles contained or implied in the Environmental Education Act of 1970 (P.L. 91-516) and its amendment (P.L. 93-278), as well as the guidelines and interpretations contained in the Federal Register.[1] The following discussion relies heavily upon quotations and paraphrases of both the Act and amendments and the Federal Register (30 January, 1974).

It is the purpose of this Act to encourage and support the development of new and improved curricula to encourage understanding of policies, and support of activities designed to enhance environmental quality and maintain ecological balance; to demonstrate the use of such curricula in model educational programs and to assess the effectiveness thereof, to provide support for the initiation and maintenance of programs in environmental education at the elementary and secondary levels; to disseminate curricular materials and other information for use in educational programs throughout the nation; to provide training programs for teachers, other educational personnel, public service personnel, and community, labor, and industrial and business leaders and employees, and government employees at state, federal, and local levels; to provide for the planning of outdoor ecological study centers; to provide for community education programs on preserving and enhancing environmental quality and maintaining ecological balance, while giving due consideration to the economic considerations related thereto; and to provide for the preparation and distribution of materials by mass media in dealing with the environment and ecology. For the purpose of this Act the term "environmental education" means the educational process dealing with man's relationship with his natural and man-made surroundings, and includes the relation of population, pollution, resource allocation and depeletion, conservation, transportation, technology, and urban and rural planning to the total human environment.

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[1] P.L. 91-516, P.L. 93-278, and the Federal Register of 30 January 1974 are fully replicated in Exhibits 9.1, 9.2, and 9.3 respectively, pages 9.16 through 9.30.

These processes should be designed to help the learner both to perceive and understand the concepts of "environment" and environmental principles and problems and to be able to identify and assess alternative solutions to environmental problems. Emphasis should be placed on the development of skills and insights needed to understand the structure, requirements, and impact within and among various environmental entities, subsystems and systems. Inquiries into both the specific and general environmental implications of human activities and their short and long term implications on social and societal resources and general public policy are suggested.

Thus the environmental education process is multifaceted, multidisciplinary, and issue, or problem-oriented. Otherwise worthwhile but specialized and narrowly defined educational approaches, such as traditional learning approaches to such areas as conservation and resource use, environmental science, nature study, outdoor education or sex education which normally tend to exclude considerations of mutually reinforcing social, physical, cultural, and policy implications of these concerns do not adequately meet the scope and purposes of the Act. While an environmental education project supported under this act could draw upon some of the ideas and materials of these traditional subject areas, it could do so only in synthesis with ideas and materials from a number of subject areas, including social sciences, technologies, arts, and humanities as appropriate and needed for the area of inquiry. Each environmental education activity partakes of contemporary particular aspects of these areas, fusing them in a manner that makes a greater comprehension and understanding of contemporary environmental issues and problems possible by bringing about deeper awareness of relevant interrelationships and, where appropriate, the nature of possible alternatives to existing environmental situations.

Stress should be laid on various disciplines working in a highly integrative manner. These special awarenesses, perspectives and skills, enable the learner to see any particular issue at hand as a phenomenon related to other phenomena and help him understand the nature of possible approaches to the issue. Environmental education activities should teach, in addition, one or both of the following (intellectual and practical) processes of problem-solving. In cases where a community environmental problem or issue might be the taking off point for an environmental education activity, the goal of the activity would be to place the issue in the (next) larger context of environmental relationships and to focus on the problem of problem-solving as a transferable learning experience and as a way to utilize the knowledge and techniques available in the traditional disciplines. In this way, citizens would acquire an information and concept base with which to analyze alternative solutions to any environmental or pollution problems in light of its environmental, social, and economic costs and benefits. One of the chief goals of environmental education is to help us learn how to proceed as a society toward a condition of productive harmony with our environment where destructive change is minimized and healthy change can proceed. Through environmental education we can learn how to explore the implications of our activities and the choices we have, and can establish a pattern of feedback to help us constantly reassess our activities. This would be the process of "continuous social diagnosis" that was emphasized in the approved recommendations of the United Nations Conference on the Human Environment in Stockholm in June 1972. It was stated that such continuous social diagnosis should "facilitate the development of social and cultural indicators for the environment in order to establish a common methodology for assessing environmental developments."

PRIMARY RECOMMENDATION: To develop core themes and a conceptual structure in environmental education that synthesizes and integrates pertinent subject matter across and between a variety of traditional disciplines.

National Data Base: The data base reveals that little integration is presently taking place. Although many environmental programs at the elementary/secondary level claim man/nature interactions as a focus, the data indicates that this concept is not stressed. In nonschool programs, these interactions are implicit in the raison d' etre of nearly all of these organizations. Two environmental education perspectives are particularly identified however: one is the nature study viewpoint and the other is the theme of man's adverse impact on nature.

Arizona Case Study: In regard to the Arizona case study data, again practically all environmental education programs claim to emphasize man/nature interrelationships but focus is primarily on nature.

In summary there is a failure at all levels for most organizations to truly implement an integrative theme relating to man and his relationship to natural and man-made surroundings. This suggests that proper approaches have not been available generally.

Rationale:

Both data and literature indicate that the single most disturbing criticism of existing environmental education, and one which probably has done more to restrain development of the field, is the claim that environmental education does not possess core methodologies and themes which make it distinctive from the disciplines that surround it. This is probably valid insofar as a large proportion of what purports to be environmental education is really an aggregation of vaguely related subject matter from other fields. In the larger view, however, this position may be a red herring that is distracting the environmental education community from establishing clear-cut programs on a broad front. Time and again the cry for integration is heard, but very few people or institutions seem to be getting down to the business of defining and utilizing those themes.

On the other hand, there is a large body of literature which expressly addresses the missing themes of environmental education. It is prominent, for example, in a century of writing in geography, ecology, and planning. The key words in these works are often the same that figure so significantly in the Environmental Education Act and its interpretations: "integration" and "synthesis." The problem historically has been one of finding effective methodologies to "integrate" and "synthesize" in a meaningful way. It does appear, however, that approaches devised in the last decade or so--such as systems analysis and energetics --may possess the interdisciplinary utility and transferability that has been lacking in the past and it is probable that such core-oriented methods may represent the means to proper expression of environmental education and its associated legislation.

The suggested five core themes as discussed in Chapters 2 and 12 serve as unifying threads or key concepts of environmental education at all levels. Each of the primary themes, Environmental Unity; General Systems Approach; Energy Flow; Economics; and Human Settlement may be subdivided into pertinent subthemes or secondary themes such as pollution, land use, population patterns, etc.

The supportive recommendations discussed below are to be viewed in the context of being specific suggestions as to how the primary recommendation may be implemented and developed. The recommendations are not necessarily in order of priority.

SUPPORTING RECOMMENDATION 1: Encouragement should be given to those projects that demonstrate an understanding of the interrelationships of local, national, and international issues and problems and their linkages.

National Data Base: Focus on local issues and problems are part of nearly all elementary and secondary programs. They are usually presented in non-textual materials and activities. When textbooks are used, a broader view, beyond the local situation, is normally stressed. Higher education tends to emphasize national and international problems rather than local ones. The advocacy sector of nonschool groups are issue and problem oriented. Interest in national and global issues is stressed, but most effort, including federal agencies, are at the local level.

Arizona Case Study: In Arizona, the advocacy sector of nonschool groups are also issue and problem oriented. But as at the national level, interest in national and global issues exist. Most effort, however, including that of federal agencies, is aimed at local level problems.

Rationale:

Although issue or problem orientation is common in existing environmental education efforts, critical links between local and national levels are largely absent. This polarity of scales thereby eliminates the opportunity to understand process and decision-making along hierarchal steps. Yet this approach is an essential component of core themes, such as general systems or environmental unity.

SUPPORTING RECOMMENDATION 2: Inclusion of values clarification in Environmental Education Courses and Programs.

National Data Base: The data base indicates that at the elementary, secondary and higher education levels, values clarification techniques are superficial at best, and nonexistent in general. Only a few nonschool organizations place major emphasis on attitudinal, ethical, and value systems, and those that do, are in the private sector and the advocacy sector.

Arizona Case Study: In Arizona, little emphasis is placed on values clarification except in the case of advocacy groups.

Rationale:

Although values clarification procedures are not called for explicitly in the Act, such procedures are implicit in much of what is called for by the Act and core themes. It is especially appropriate to emphasize programs which advocate a values clarification process as an integral part of the substantive content. This process should not inculcate a particular set of values; rather it should encourage the learner to examine and recognize behavior by clarifying purposes, beliefs, attitudes, and other value indicators. Similarly, it seems important to examine various lifestyles in the context of environmental problems since it seems likely that an "ecologically balanced" man-nature interrelationship will require structural change in our lifestyle.

SUPPORTING RECOMMENDATION 3: Programs should be developed to generate awareness of career opportunities in environmentally related areas and also for the training of individuals to work from a holistic frame of reference concerning the environment.

National Data Base: Career education at the elementary/secondary levels is primarily treated as a peripheral issue; that is, "something to think about." It may be dealt with in a general awareness context rather than from a specific occupational perspective. On the higher education level, students tend to be "gunshy;" that is, they are leery of entering a program that is not discipline-oriented. In nonschool-based situations little reference is made to career education; however, where it is (e.g., business and industry), it is infused into their information materials. Federal materials treat career education either at the general awareness level or at a semitechnical level; most discussion centers on careers which are closely identified with natural or engineering sciences.

Arizona Case Study: The Arizona case reveals that over 25% of the government sector and 63% of the education sector include activities involving education for careers. The other sectors have little or no commitment in this area.

Rationale:

Environmental job opportunities should be given more attention in career education programs. Career education, which is heavily funded at the present time, devotes little attention to environmental education and associated job opportunities. Efforts in career education should also go beyond the K-12 level. Concurrently, more work-study and internship programs should be implemented. Federal and state funds could usefully support such programs.

SUPPORTING RECOMMENDATION 4: Support should be allocated for the development of teacher competency programs to optimize the articulation of core themes.

National Data Base: The data indicate that in the elementary and secondary schools emphasis pedagogy often features fragmented information learning, rather than holistic and integrative methods. Some attention is being given to techniques such as inquiry, simulation, and role-playing. In higher education, the lecture method, testing and team-taught courses (which are often "turn taught") are stressed; while in nonschool situations many organizations stress information through printed materials, slide presentations, films, lectures, and various types of demonstrations.

Arizona Case Study: The Arizona study reveals that the majority of environment-related information is taught using the lecture-presentation approach and the imparting of facts concerning environmental problems.

Rationale:

Environmental education is an extremely complex field for both the student and the teacher. Unless the teacher has previous training in environmental studies or environmental science, even the use of the so-called teacher proof materials is questionable. One way to reduce that risk is to provide appropriate inservice activities to prepare teachers, from both formal and non-formal sectors, to be proficient in the use of the inquiry method, problem solving techniques, environment-specific related skills, of affective learning techniques, communication skills, role playing and gaming skills, audio-visual materials, the development of outdoor related skills, and assessment techniques.

Where proven inservice programs in environmental education exist, every effort should be made to fund and continue the programs. Schools of education, state departments of education, and local school districts should be encouraged to coordinate their efforts to facilitate continuance and support of the proven programs.

Support should be encouraged for pilot programs which emphasize a combination of inquiry method, problem solving, skill development, and affective domain. Although many courses and programs utilize problem-solving and inquiry methods, the greater proportion of effort is reserved for information and facts taken from disciplinary bases. This should be balanced by increased and more sophisticated attention to integrated problem solving and research methods.

Finally, consideration might be given to developing a film dealing with the core themes, to be funded and distributed by the federal government, in an effort to promote the core theme structure of environment education and to prepare teachers and enrich their background.

SUPPORTING RECOMMENDATION 5: Administrative and structural organization which facilitates and rewards integrated core themes and their delivery systems should be encouraged in all sectors.

National Data Base: While there are many ways in which the various elements of the environmental education system are interconnected (funds, personnel, training programs, use of equipment, facilities, materials, media) there is strong evidence of competition, duplication, and contradiction among the various elements.

There seems to be considerable multidisciplinary organization, but only a few examples of interdisciplinary organizations exist. Disciplines prevail; however, the burden may be placed upon students to integrate from disciplinary inputs. Interdisciplinary programs are very difficult to transfer because they require administrative commitment to reorganize existing administrative units. Therefore, they are found mostly at new institutions. The interdisciplinary format, most common at the elementary level, decreases at the higher levels in the formal education structure.

While it was not totally possible to ascertain a pattern, evidence does indicate widespread participation of many different types of organizations in environmental education. Half of the school systems have some sort of federal support for environmental education programs.

Arizona Case Study: In Arizona, the data indicates a situation very similar to that which exists at the national level.

Rationale:

The existing predominate mode of administrative functioning is the formal hierarchy which normally minimizes integration of the disciplines or sub-sectors of the whole organization. The resulting specialization has lead to the accumulation of vast quantities of new information, but has also the result of cutting off that knowledge from any central common pool and from cross-fertilizing contacts with other branches of thought or policy. The growth of a tradition which fosters core themes and a common basis for human action is impeded by this formal hierarchy. Suggested above is the encouragement of alternative administrative and structural organizations (discussed more fully in Chapter 12) such as the semi-lattice or organic hierarchy.

Schools and colleges of education must be encouraged and convinced of the importance of their role in the development of environmental education. A huge proportion of the effort and leadership in environmental education has come out of the nonschool and the disciplinary-oriented sectors. Much has been accomplished; however, the absence of major inputs from most Schools of Education has seriously inhibited the introduction of organized, environmental education into the classroom. Schools of Education should assume a leadership role in the development of K-12 programs and the endorsement of teachers compatible with the core theme structure. In the best worlds, Education Schools should provide major inputs to core theme design and implementation.

SUPPORTING RECOMMENDATION 6: A communication network including existing environmental education materials, their classification, and retrieval systems should be made available for utilization by all citizens.

National Data Base. From the data available at the national and the state levels, it is clear that coordination of environmental education is weak in two respects: (1) the inventory and classification of environmental education programs and materials; and (2) a system for disseminating these programs and materials nationwide.

Arizona Case Study: Arizona's information flow system in environmental education is weak at formal levels, but strong at voluntary, informal levels. As a by-product of the Project's work a detailed inventory of environmental education programs and activities is now available.

Rationale:

The Act provides ample support for this recommendation through its stated support for community education, curricular development, and dissemination of environmental education information.

Communication between individuals and organizations involved in environmental education remains relatively uncoordinated. The descriptive materials regarding the more promising programs and courses remain fugitive documents and unavailable and unknown to most of the environmental community. Regional and/or state environmental education centers, coordinated through a federal center, could serve as clearinghouses to facilitate communication and access to source materials. Such offices should operate as a network and not in isolation. In conjunction with and to facilitate this objective it is also suggested to develop leadership roles and vertical coordination and communication in school systems by the establishment of state and local school coordinator positions.

Before implementing new programs or continuing to fund old activities in either program development, research, or teaching, states and communities should inventory existing activities. Money and effort can be saved if unnecessary overlap and redundancies are eliminated. At the same time, significant gaps in environmental education can be identified (the Arizona Survey is a pilot example of this process). In other words, educational planning should develop from a sound data base.

SUPPORTING RECOMMENDATION 7: _Environmental education must penetrate all sectors of society and in all areas. Therefore, special efforts need to be made to assure access to groups not now adequately targeted (e.g., the mentally and physically handicapped, senior citizens, ethnic minorities, low income groups, preschoolers and others)_.

National Data Base: Insufficient effort is being expended in these special areas. There are few programs for the handicapped and minorities at either community-wide levels or in elementary, secondary, and higher education. Most outdoor-oriented programs are similarly lacking.

Arizona Case Study: Data from the Arizona Survey provided very little direct evidence of programs designed for special groups in the above context.

Rationale:

In order to address this lack of attention, special emphasis should be placed on adapting and altering existing and planned materials for special audiences.

SUPPORTING RECOMMENDATION 8: A Greater number of key personnel such as educational administrators, curriculum coordinators, academic department heads, corporate executives, government leaders (of all levels) and community leaders need to be involved in seminars and other training programs that will introduce them to core theme approaches and rationales.

National Date Base: On the national level, many programs at elementary/secondary levels are directed to teachers in the form of teachers' manuals; the teachers are, in turn, expected to adapt and transfer the material to students. Inservice training in environmental education is not common on the higher education level and little is found in graduate programs. Very little effort is made to develop inservice programs for college teachers. Institutions of higher education do not provide many courses or programs to train teachers in environmental education; while the nonschool-based level often have organizations rather than people as the main target.

Arizona Case Study: In the case of the Arizona data, organizational efforts are designed primarily to service other organizations, especially advocacy groups and schools. More than 1/3 of the environmental organizations conduct some type of inservice programs.

Rationale:

Through mechanisms of education and funding, the promotion of a stronger leadership and participatory role in environmental education among groups with "latent" potential should be accomplished. Many individuals and organizations have a capacity to make significant impacts on environmental education, but for reasons of disinterest or lack of funding, have been unwilling to participate. Examples of this target audience are librarians, curators, many professional organizations, and even some environmental research institutes.

Finally, formal educational institutions should be more involved in community education and vice versa. The physical and human resources of schools, universities and nonschool organizations should be made available to all sectors of the community through special environmental education programs. Conversely, the community should be encouraged to turn to these organizations for resources and occasional leadership. Pilot programs can be funded at low cost in this area.

SUPPORTING RECOMMENDATION 9: Professional analysis of progress in environmental education should be an on-going national task.

Rationale:

Year-to-year budget priorities can be more effectively determined with this information sample from the total population, not just the school aged. Further, those sectors of the population not currently targeted by environmental education should be identified. Federally funded projects should always include a self-analysis mandate; and independent, in-depth assessments of nationally supported programs should be accomplished on a sample basis. Information on the most successful programs could then be communicated to the rest of the environmental education community.

Summary

The supportive recommendations discussed above are to be viewed in the context of being specific suggestions as to how and sometimes why the primary recommendation should be developed and implemented. These have been presented in the context of the primary recommendation: To develop core themes and a conceptual structure in environmental education that synthesizes and integrates pertinent subject matter across and between a variety of traditional disciplines. This is the goal (what) by which environmental education can be most effectively defined, communicated, and learned. It is hoped that the core theme concept will provide a workable framework within which environmental education can evolve along productive pathways.

The Nature of This Report (Volume I)

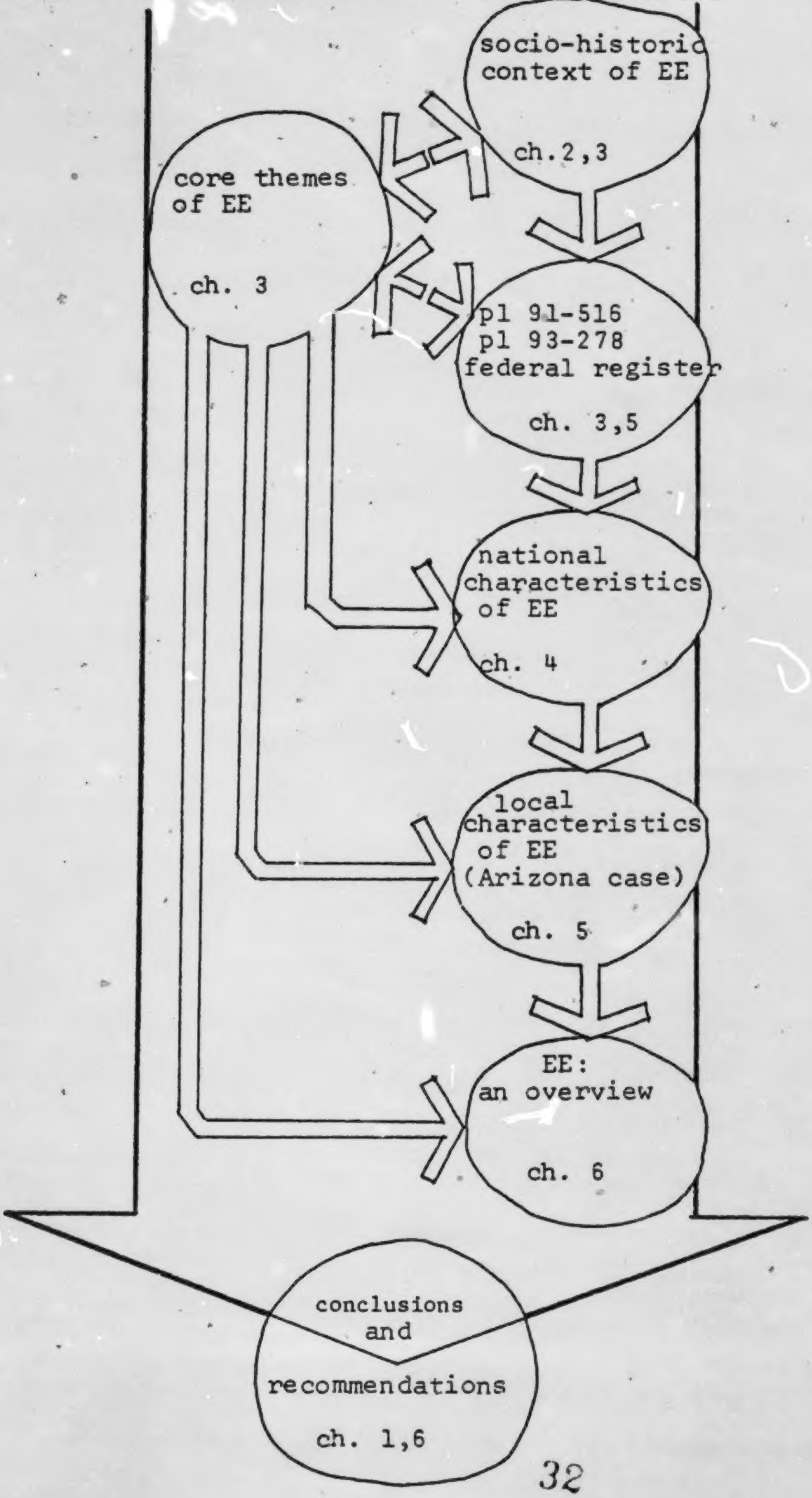
The means by which the findings and recommendations given in this report were reached follows a sequential rationale. The mandates of the study were to: (1) develop historical and current perspectives of environmental education and its relationship to environmental trends in the United States; (2) identify and assess key core themes for environmental education; (3) provide a nationally sampled inventory of current environmental education activities in the United States at elementary and secondary school levels, in higher education, and in nonschool-outdoor-based situations; (4) accomplish a core example inventory and assessment at less than the national level; and (5) relate all of the above to the Environmental Education Act of 1970 (PL 91-516), its amendment (PL 93-278), and interpretations in the Federal Register. It was expected that a major outcome would be the definition of the frequency and magnitude with which the various tenets of the Environmental Education Act and core themes are or are not reflected in existing environmental education, thus leading to conclusions and recommednations vis a vis future developments and priorities in the environmental education field.

The following chapters sequentially treat these topics. The rationale of both the research and the chapter ordering is schematically illustrated in Figure 1.1. In Chapter 2 the socio-historical context of environmental education in the United States is briefly described and explained--leading to an examination of current and potential perspectives on environmental education (Chapter 3). Emphasis is given especially to environment-based environmental education.

Selected core themes, which have been identified by this project and elsewhere, are also described in Chapter 3 and 6. It is significant that these themes have evolved because of the interplay between the historical

Figure 1.1

A SEQUENTIAL RATIONALE FOR INTERPRETATION OF ENVIRONMENTAL EDUCATION IN THE UNITED STATES: a schematic model


socio-historic context of EE
ch.2,3
core themes of EE
ch. 3
pl 91-516
pl 93-278
federal register
ch. 3,5
national characteristics of EE
ch. 4
local characteristics of EE (Arizona case)
ch. 5
EE: an overview
ch. 6
conclusions and recommendations
ch. 1,6

development and context of the environmental field and the intellectual constructs focusing on environmental education. Similarly, the Environmental Education Act is a product of thematic thinking, although the rhetoric of the Act and the rhetoric of core themes are sufficiently alike that a double-ended arrow is used (Figure 1.19).

Later chapters follow from the national to local scales, focusing on the relationship of environmental education activities to the expectations expressed in the Law and the core themes (Chapters 4-5). From this data base, an overview is summarized in Chapter 1 which leads to conclusions and recommendations.

A significant attribute of environmental problems and environmental education (and this point is reiterated in later chapters) is that the complex interacting processes and phenomena that must be treated in the environmental field are essentially the same as those that have been also identified and examined in broader based works dealing with man, his culture, his relationship to nature, and the future. For this reason, it is useful to sometimes view the development of core themes and environmental education in the larger context of the philosophical and methodological works which address man, nature, and world views (Chapter 6).

CHAPTER 2

HISTORICAL PERSPECTIVES OF THE ENVIRONMENTAL MOVEMENT AND ENVIRONMENT-BASED EDUCATION

Introduction

A major purpose of this project is to identify the status of contemporary natural environment-based education and make recommendations vis a vis its future content, structure, and pedagogy. The inventories and analyses delineated in Chapters 4 and 5, the current perspectives and themes in Chapter 3, and the overviewed recommendations presented in Chapters 1 and 6 must necessarily be based on an understanding of the earlier history and traditions of the environmental movement and its associated educational efforts. This chapter, therefore, provides a context within which such discussions and interpretations are considered. It reviews the evolution of the environment- and landscape-based movements in the United States through the recent environmental thrust of the late 1960's and early 1970's.

The evolution of environmental education can be illustrated through an historical account of key developments, elements and their interrelationships. The process of education often operates outside the traditional academic institutions. Three principal areas are considered: (1) an assessment of the contributions and influence of the prophets and philosophers of the American conservation movement; (2) a summary of the various "environmental" organizations, activities, and events that have exemplified the Nineteenth and Twentieth Century environmental scene; and (3) reflections on the environment-related legislation which partially evolved from the above philosophies, organizations and activities. Each of these categories reflects the mood, attitude, and spirit of a segment of the American populace. The interrelationships of the three areas are discussed, and particular emphasis is given to the role of outdoor or environment-based environmental education activities.

Before proceeding to the substance of this chapter, it is worth noting that discussions of "environment" and associated processes or attributes, tends to bog down in semantical confusion. Earlier accepted meanings of such words as "ecology" and "environment" for example, have been twisted and almost forgotten outside their academic and discipline-specific homes. For purposes of clarification, selected words or expressions are defined here. It is realized that other definitions exist; the following paragraphs simply present the terms as used in this report.

"Environment" is used herein as the aggregate of external conditions that influence the life of an individual or population, including the life of man. This is essentially a traditionally ecological definition that includes both natural and cultural components. Although one or the other is often emphasized (e.g., physical or natural environment, human environment), this report uses the word only in the inclusive, integrated sense (sub-environments will always be given a prefix). It is also assumed that the material products of man are an integral part of environment. A house, for example is a feature of both physical and cultural realms--"on the one hand, it is made of materials subject to the work of physical processes; on the other hand, it is largely a cultural fabrication" (Marcus and Detwyler, p. 6). The three major components or levels within environment--natural, human, and built--are illustrated in Figures 6.1 and 6.2.

Current usages of "environmentalism" and "environmentalist" sometimes limit the meanings of the words to specific values, activities, or positions.

A frequent and unfortunate practice recently has been to use the words in either a complimentary or pejorative sense, as in the good guy-bad guy syndrome. "Environmentalism" in this text refers more broadly to the set of ideas and beliefs which lead towards a desire to understand, explain, and manage environment (including man) in an integrated and synthesized manner. An "environmentalist" is one who subscribes to and practices this broadly defined environmentalism.

Any reference in this text to environmental "movements" (or similar terms) refers to converging activities, philosophies, individual and group actions that are exemplified by an increase in awareness and implementation of environmentalism. The precise characteristics of any environmental movement reflect, of course, the context of intellectual and environmental knowledge and attitudes in given historical periods. Thus, what in retrospect is labeled environmentalism or an environmental movement may have operated under labels such as conservation or resource education. Further, it is understood that the milieu and accomplishments of environmentalism may have varied from period to period (e.g., greater emphasis on natural sciences), but the integrative philosophical underpinnings are considered constant.

"Environmental education" is used firstly in this text as it is represented in the Environmental Education Act and its amendment (PL 91-516; 93-278; see amplification in Chapters 3, 5, and 6). Secondly, precedent to the law but not exclusive of it, environmental education encompasses integrative and synthesizing teaching and learning as they interrelate across the natural, human, and built sectors of environment. What has been represented as environmental education has not always fulfilled this definition; often it has been more fragmented or discipline specific. "Environment-based," "nature-oriented," or "outdoor-oriented," environmental education are taken to mean education taking place anywhere in the out of doors, including school yards, neighborhoods, and cities, as well as rural and wilderness places.

The Historical Context

During the 1800's two doctrines of nature and man's role therein were prevalent. Manifest Destiny, a justification of American expansionism, was popular during the last half of the century. However, many Americans adhered to a different philosophy exemplified in the concept of "the balance of nature." This group denounced man's greed for the growth at the expense of the shrinking wilderness. Support for the balance of nature theme called for aesthetic preservation of man's domain. Thus, the historical development of environmental movements and education in the United States is often seen as a confrontation between these two doctrines and their adherents.

It is not, of course, that simple. The historical complex of interacting social, economic, and political forces presents a tableau of overlapping patterns, policies, and philosophies. And historical discussions usually require that sooner or later there be some definition of "eras" or significant dates and events. For the historical treatment of environment, as for any subject, this requirement implies an identifiable Darwinian format; that is, the existence of a sequential process leading from birth through youth, maturity, and old age. This is an especially dangerous approach to environmental history in that the existing literature suggests there is a single real chronology involving man's world view of environment--and that singular view has somehow expanded and progressed during the last 500 years.

In the United States, for example, the tendency is to identify the birth of environmentalism simultaneously with the period of westward expansion. This is a response, perhaps, to the overriding impact of the Industrial Revolution, whereby exponential population growth and man's escalating capacity for resource exploitation eventually raised questions regarding long-term resource supply and human demands. Certainly, this is the Malthusian theme that has prevailed since the turn of the Nineteenth Century and which has been strongly reinforced in neo-Malthusian writings in the post-World War II period.

In other words, during these past two centuries, western man has moved sufficiently away from a direct dependence or interrelationship with environment--so as to lose sight of the fact that human history always has been characterized by a strong need to understand and cope with environmental questions. There is, in this context, nothing new about environmentalism and environmental education; humans have been continuously involved in these topics. Indeed, the new environmentalism of the Nineteenth and Twentieth Centuries is nothing more than the rediscivery of old and persistent themes by a technologically adept society.

Many scholars (e.g., Kluckholn, 1961 and Burton and Kates, 1964) recognize that human society interacts with natural environment in one of three ways: man over nature, man under nature, and man with nature. The pre- and post-revolutionary populations of North America were, in fact, represented by all three of these environmental world views. Many of the early European immigrants, as well as peasant societies of Hispanic

America, subscribed to the man under nature philosophy, whereas the Eskimo and many American Indians believed that man lived with nature in harmonious interaction. The majority of European settlers (or new Americans), came out of an industrializing Western Europe and a Judiac-Christian tradition which preferred the man over nature philosophy. This latter group soon dominated the American development both philosophically and numerically. They brought to the United States a dynamic and expanding growth pattern on the one hand and the basic problems which required the new environmentalism on the other hand.

In this respect, the doctrine of Manifest Destiny dominated American development for at least its first 100 years, and retained its proponents even to the present (e.g., utilization of Alaskan resources). This expansionist attitude--based on the richness and seeming boundlessness of the land, as well as political and socio-economic demands to gain sovereignty over the continent--is often seen as both the key to the uniqueness of America and its people's ability to conquer the wilderness. Frederick Jackson Turner (1893), for example, considered Manifest Destiny and the pushing of the frontier as the explanation of American success.

There is little point in repeating the entirety of American history at this point except to recognize that a tremendous proportion of it was involved in the settling, exploitation, and agricultural and industrial development of the resource base--all activities that impacted on the landscape and affected American attitudes toward environment.

2.7

Emergence of Environmentalism

There are many contradictions and ironies in the ways that Americans have used and perceived the natural landscape. If, on one hand, the early settlers were struck by the extraordinary beauty and bounty of the land, they set out to subdue and exploit it on the other. Or, there is the irony as Stuhr (1973, p. 69) points out: "People who had always been denied land and its resources were not, after settling in America, protectively appreciative of it." From the very beginning, the new Americans wanted their cake and to eat it too.

Inevitably, reactions to expansion and exploitation set in. At few times, however, did people speak with one voice. Rather, it was the cry of a single individual or small group. Thus, the trappers and frontiersmen who had made their living by careless exploitation of wildlife were the first to decry the passing of the American wilderness into the hands of farmers, livestock raisers, and lumbermen. Much of what might be viewed as early manifestations of an environmental movement were in reality the reactions of advocates committed to particular economic pursuits and frontier lifestyles.

The initiation of the conservation and environmental movement in the United States is, perhaps, more accurately identified in the mid-Nineteenth Century by the emergence of the writings and lectures of an intellectual few. These advance men for conservation were influential and their ideas and goals were often implemented, after some lag, through the formation of environmentally-oriented organizations and the enactment of conservational legislation.

Since then environmentalism has waxed and waned in many guises; preservationism, conservation, resource management, ecology, and nature training are, for example, labels that have represented portions or the whole of the environmental spectrum. The three peak environmental periods--which had strong identification with the political fortunes of Theodore Roosevelt and Franklin Roosevelt, and a loose association with the consecutive administrations of Lyndon Johnson and Richard Nixon--are significant benchmarks in the American attitude to environment and environmental education.

In each case, however, the cresting of environmental action was preceeded and influenced by a wide variety of related position papers, events, and legislation. These interacting events and processes are summarized in Figure 2.1, which presents a chronological and comparative view of environmentally-related trends in the United States.

The Early Environmental Period

The first major blossoming of environmental concern in the United States culminated in the conservation-oriented administration of Theodore Roosevelt. Before this time, however, the foundations of the conservation movement had been laid. The cornerstone was surely George Perkins Marsh's Man and Nature (1864), later retitled The Earth as Modified by Human Action. He has been fairly represented as:

> the first American to lay down for the populace the broad principles of conservation and to demonstrate, by examples from other countries, the direction in which America was headed by wantonly wasting her forests. These broad principles were based upon the doctrine of ecological balance (H. B. Hawkes, 1960, 11).

Marsh presented, as did his contemporary Alexander Woiekoff in Russia, a rational informed, and realistic statement of the balance-of-nature philosophy and man's impact on it. If Marsh's work is in retrospect the cornerstone upon which the conservation movement was built, other voices were also heard and their influence felt.

EVENTS	ORGANIZATIONS AND AGENCIES	LEGISLATION	PHILOSOPHIES AND PHILOSOPHERS	YEAR
EXPANSION OF THE FRONTIER		PLYMOUTH COLONY - TIMBER CUT & SALES REGULATION		1626
		R.I.-DEER SEASON LIMIT		1639
		WM. PENN- LEAVE 1 ACRE FOREST FOR EVERY 5 CUT		1681
		BRITISH COLONY POLICY- SELECTED CUTTING		1691
		N.Y.-CLOSED HUNTING SEASON		1791
			MALTHUS-POPULATION VS. SUPPLY	1798
				1800
		MASS.-USEFUL BIRD PROTECTION IN HUNTING SEASON		1818
↓				1825
FLA.- FED. FOREST MANAGEMENT				1828
CATLIN-"NATIONAL PARKS" IDEA				1832
			EMERSON - NATURE	1836
	U.S. DEPT. OF INTERIOR GEN. LAND OFFICE OF D.O.I.- LAND GIVEAWAY			1849
				1850
	YMCA ESTABLISHED			1851
			THOREAU- WALDEN	1854
MT. VERNON-1ST HISTORIC SITE			OLMSTEAD-"PUBLIC PARKS NEED" -CENTRAL PARK DESIGN	1858
		HOMESTEAD ACT MORRILAND GRANT COLLEGE ACT		1862
MAN & NATURE PUBLISHED YOSEMITE VALLEY STATE PARK			MARSH - MAN AND NATURE	1864
POWELL- INTO GRAND CANYON				1869
YELLOWSTONE EXPEDITION				1870
	U.S. FISH COMMISSION			1871
ARBOR DAY YELLOWSTONE - 1ST NATIONAL PARK		MINERALS LAND ACT		1872
		TIMBER CULTURE ACT DESERT LAND ACT		1873
	AMERICAN FORESTRY ASSN.			1875
	APPALACHAIN MOUNTAIN CLUB			1876
POWELL- IN GRAND CANYON		TIMBER & STONE ACT		1878

	US. GEOLOGICAL SURVEY			1879
				1880
	DIVISION OF FORESTRY UNDER DEPT. OF AGRICULTURE			1881
1ST YMCA CAMP - BROOKLYN	AMERICAN FORESTRY CONGRESS			1882
	AMERICAN ORNITHOLOGIST UNION			1883
ADIRONDACK STATE PARK NIAGARA RESERVATION	YMCA CAMPS DIVISION OF ECONOMIC ORNITHOLOGY AND MAMMOLOGY BOONE AND CROCKETT CLUB			1885
	N.Y. AUDUBON SOCIETY	MINERALS LAND ACT		1886
			MUIR - SIERRA CLUB	1890
USGS - DAM/IRRIGATION PROJECTS YOSEMITE - NATIONAL PARK	ROCKY MTN. SPORTSMAN'S ASSN. NATIONAL IRRIGATION CONGRESS	GENERAL LAND LAW REVISION ACT FOREST RESERVE ACT		1891
	SIERRA CLUB			1892
FIELD & STREAM WEEKLY	YMCA CAMPS CAREY ACT	PARK PROTECTION ACT	GRINNELL - GAME LAWS	1894
	AMERICAN SCENIC & HISTORIC PRESERVATION SOCIETY		PINCHOT - MULTIPLE USE OF RESOURSES	1895
		FOREST MANAGEMENT ACT		1897
G. CLEVELAND - 21 MILLION ACRES FOR FOREST RESERVES MUIR - PINCHOT BATTLES CORNELL UNIV. - FORESTRY COURSES PINCHOT - HEAD OF DIV. OF FORESTRY				1898
		LACEY ACT - INTERSTATE TRANSPORT OF ILLEGALLY KILLED GAME		1900
1ST SIERRA CLUB ANNUAL OUTING	SOCIETY OF AMERICAN FORESTERS		T. ROOSEVELT - PRESIDENT	1901
25 RECLAMATION PROJECTS	BUREAU OF RECLAMATION	RECLAMATION ACT		1902
PELICAN ISLAND - 1ST WILDLIFE PRESERVE				1903
	AMERICAN GAME PROTECTIVE ASSN. CAMPFIRE CLUB AMERICAN BISON SOCIETY US. FOREST SERVICE SPLIT FROM GENERAL LAND OFFICE NATIONAL ASSN. OF AUDUBON SOCIETIES			1905
		ANTIQUITIES ACT - NATIONAL MONUMENTS		1906
	INLAND WATERWAY COMMISSION			1907
GOVERNOR'S CONFERENCE FOR CONSERVATION INVENTORY GRAND CANYON - NATIONAL MONUMENT	NATIONAL CONSERVATION COMMISSION			1908
N. AMERICAN CONSERVATION COMM.	NATIONAL CONSERVATION ASS'N.		A. LEOPOLD - U.S. FOREST SERVICE	1909
BALLINGER/PINCHOT CONTROVERSY	FOREST PRODUCTS LABORATORY	LEGISLATIVE BATTLES		1910

	AMERICAN GAME PROTECTIVE & PROGATION ASSOCIATION	AUDUBON PLUMAGE BILL WEEKS ACT INTERNATIONAL TREATIES TO PROTECT SEALS & OTTERS (U.S.S.R., BRITAIN, JAPAN)	PEARSON — BINDS LOBBYISTS	1911
HETCH-HETCHY VALLEY		FEDERAL MIGRATORY BIRD ACT	HORNADAY - SCARCE BIRD SPECIES PROTECTION	1913
OVERLAND PARK - 1st MUNICIPAL CAMPGROUND (DENVER)				1915
		NATIONAL PARK SERVICE ACT NATIONAL FOREST SERVICE ACT		1916
	SAVE-THE-REDWOODS LEAGUE	MIGRATORY BIRD TREATY ACT		1918
AUTOS FOR CAMPING	FEDERAL MONEY FOR CONSERVATION RESEARCH	FEDERAL WATER POWER ACT MINERAL LEASING ACT	H.H. BENNETT - SOIL CONSERVATION H. ALBRIGHT — AESTHETIC CONSERVATION	1920
	IZAAK WALTON LEAGUE			1922
KAIBAB PLATEAU MULE DEER DIE ASSN. OF DUDE RANCHES GILA NATIONAL FOREST 1st NATIONAL CONF. - OUTDOOR REC. TEAPOT DOME SCANDAL	FEDERAL OIL CONSERVATION BOARD	CLARKE-McNARY ACT		1924
APPALACHAIN TRAIL CONFERENCE				1925
WILLIAMSBURG VA. - RESTORATION				1926
NATURE MAGAZINE - CAMPS SCOUTS - CAMPS CAMPFIRE GIRLS - CAMPS				1927
HOOVER DAM		McSWEENEY-McNARY ACT FOREST RESEARCH		1928
		NORBECK-ANDERSON BILL WETLANDS PURCHASE		1929
BIOLOGICAL SURVEY - PREDATOR CONTROL CAMPING TRAILERS COMMISSION ON OVERGRAZING	COMMITTEE - CONSERVATION AND ADMINISTRATION OF PUBLIC DOMAIN		B. MACKAYE — CITY IMPACT UPON THE ENVIRONMENT DARLING - PRESIDENT OF NATIONAL WILDLIFE FEDERATION CARTOONIST WATER FOWL CONSERVATIONALIST	1930
SOIL EROSION SERVICE C.C.C. T.V.A. NEW DEAL	SOIL EROSION SERVICE C.C.C. TVA	NATIONAL YOUTH ACT CCC TVA	F.D. ROOSEVELT — PRESIDENT	1933
PACIFIC CREST TRAILS CONF. GREAT PLAINS DROUGHT		TAYLOR GRAZING ACT		1934
	WILDERNESS SOCIETY EVERGLADES NATIONAL PARK	SOIL CONSERVATION ACT		1935
JOSHUA TREE NTL. MONUMENT	NATIONAL WILDLIFE FEDERATION	OMNIBUS FLOOD CONTROL ACT		1936
J.W. STUDEBAKER — CONFERENCE ON CONSERVATION EDUCATION		PITTMAN-ROBERTSON ACT		1937
		FOREST SERVICE "U" REGULATION		1939
	U.S. FISH & WILDLIFE SERVICE			1940

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	SOIL CONSERVATION SOCIETY OF AMERICA			1944
	US BUREAU OF LAND MANAGEMENT			1946
EVERGLADES NATIONAL PARK				1947
	THE CONSERVATION FOUNDATION	FEDERAL WATER POLLUTION CONTROL LAW		1948
SIERRA CLUB BIENNIAL WILDERNESS CONFERENCE NATIONAL TRUST FOR HISTORIC PRESERVATION	NATIONAL TRUST FOR HISTORIC PRESERVATION			1949
				1950
	"RESOURSES FOR THE FUTURE"	DINGELL-JOHNSON ACT		1952
OUTDOOR RECREATION RESOURCES REVIEW COMMISSION	OUTDOOR RECREATION RESOURSES REVIEW COMMISSION			1958
ST. LAWRENCE SEAWAY		MULTIPLE USE ACT		1959
			S.UDALL - SEC. OF THE INTERIOR - THE QUIET CRISIS	1961
J. KENNEDY - WHITE HOUSE CONFERENCE ON CONSERVATION			R.CARSON - SILENT SPRING	1962
	BUREAU OF OUTDOOR RECREATION IN DEPT. OF INTERIOR	CLEAN AIR ACT		1963
NATIONAL WILDERNESS PRESERVATION SYSTEM	LAND & WATER CONSERVATION FUND ACT WILDERNESS ACT	LAND & WATER CONSERVATION FUND ACT WILDERNESS ACT		1964
L. JOHNSON - CONFERENCE ON NATURAL BEAUTY	ENVIRONMENTAL POLLUTION PANEL.		L. JOHNSON - BEAUTIFICATION PROGRAM	1965
		NATIONAL PRESERVATION ACT		1966
1st EARTH DAY				1968
		NATIONAL ENVIRONMENTAL PROTECTION ACT	P. EHRLICH - D.D.T. DANGERS B. COMMONER - CENTER FOR BIOLOGY & NATURAL SYSTEMS	1969
NATIONAL EARTH DAY				1970

The transcendental writings of Henry David Thoreau, Ralph Waldo Emerson, and others--which expounded the benefits to be accrued from communion with the natural world--laid the philosophical groundwork whereby many Americans made at least the intellectual transition from a resource exploitation ethic to an aesthetic environmental ethic. The aesthetic approach, which also posited a preservational attitude, was further enhanced by the lectures and publications of environmental prophets such as naturalist John Muir, editor-conservationist Robert Underwood Johnson, and artist-writer George Catlin.

While the aesthetic conservationists tended to promote a back-to-nature wilderness philosophy, another group more immediately influenced American environment policies and action. These were the scientist-conservationists and resource managers, who saw the role of nature in terms of its utility to man. Typical of these were politician-forester Gifford Pinchot, geologist-explorer John Wesley Powell, academic administrator and soil scientist Nathaniel Shaler, forester Carl Schurz, and wildlife champion George Bird Grinnell.

The preservationists and utilitarian conservationists often clashed and presented contradictory views. There was, nevertheless, a common thread in that all desired environmental quality--albeit, perceived in light of their specific backgrounds and values. In any event, the cumulative and converging efforts of these environmental advocates and their disciples led to the formation of nature and outdoor-oriented organizations, legislation, and new public policies. Among the important organizations that emerged before 1900 were the Audubon Society, the Appalachian Mountain Club, the Sierra Club, the Boone and Crockett Club and the American Scenic and Historic Preservation Society.

The YMCA, YWCA, and 4H Clubs were typical of organizations with a partial outdoor orientation that appeared during the same time.

Meanwhile, a broad spectrum of environment-related legislation was passed. It is significant that much of this legislation promoted a continuing settlement and exploration of the land (e.g., the Homestead Acts, Timber Culture Act, Mineral Land Act, Desert Land Act). Some legislation did, however, begin to withdraw or protect land from uncontrolled exploitation (e.g., General Land Law Revision Act of 1891, Forest Management Act of 1897, and the creation of Yellowstone and Glacier National Parks).

By the time Theodore Roosevelt entered office, a trend had already been set whereby the nation was gradually and slowly withdrawing from the tenets of Manifest Destiny. Roosevelt was much influenced by the pronouncements and recommendations of men such as Pinchot, Powell, Muir, and Grinnell. Some of the earlier environmentalists served in his administration; Pinchot was particularly influential. Roosevelt's tenure was characterized by an explosion of conservation actions, which included the organization of national and international conservation commissions and conferences and the passing of important legislation relating to wildlife, forests, and water.

An outdoorsman and nature lover, Roosevelt sympathized with the preservationists and set lands aside for national forests and wildlife refuges. On the other hand, he subscribed to the utilitarian approaches and much of his legislation was directed toward wise resource management.

Thus, through the medium of the presidency the United States experienced for the first time a period of national public awareness of major environmental problems and policies. This was the first focused input of the federal government into environmental and conservational affairs. The effort was not totally integrated; much energy and attention was given to specific facets of the environment, particularly forests, wildlife, fish and water. In the long run, however, while the public was widely aware of these activities, the actions of both government and public groups still represented primarily the support, advice, intent and philosophies of a highly educated, elitist sector of the population.

The Second Environmental Period

A second crest of environmental and conservational activity arrived with the depression years administration of Franklin Delano Roosevelt. His "New Deal" programs signaled the first major entry of the federal government into broad and multidisciplinary environmental planning at regional levels. Federal authority, regulations and management peaked in a number of controversial projects such as the Tennessee Valley, Columbia River and Missouri Valley Projects. As the Theodore Roosevelt administration was characterized by attempts at preservation and some utilitarian conservation of a disappearing resource base, the Franklin Roosevelt administration directed its efforts more to problems of integrated and broad-scale resource management plans.

The New Deal's resource management programs were dramatic and innovative; probably could not have been initiated except for Roosevelt's landslide election mandates and the extreme unemployment of the 1930's; and represented a wide swing of the pendulum to the relative environmental left after more than 20 years position on the reactive right.

Earlier, the antitrust and pro-environment policies of Theodore Roosevelt had come under attack in the later years of his administration. Subsequent administrations adhered to policies which were dedicated to the philosophies of free enterprise and individualism; by definition in the logic of the times, this meant that regulation of environment and resource management should be minimized. This laissez-faire attitude was further exacerbated by two factors: (1) the rapid and often wasteful resource exploitation required by World War I, and (2) a general public reaction against wartime restrictions and regulations in the post-war period. For example, Nash (1968, p. 139) notes: "Riding to office on a wave of reaction to wartime restrictions, Harding understood little of the necessity for conserving natural resources." Even considering the earlier Tea Pot Dome scandal, the subsequent Coolidge administration conducted a policy of unfettered private enterprise. The Coolidge-established Federal Oil Conservation Board, for example, concluded, in seven annual reports, that private companies, not the government, must bear the burden of wise conservation (Hawkes, 1960).

Some environmental organizations and legislation did appear during the pre-depression period. These included the passage of the Migratory Bird Act, the formation of the Izaak Walton League of America, and the creation of the National Park Service with its associated proliferation of natural preserves. The latter was primarily due to the relentless promotional efforts of Frederick L. Olmsted, Jr., Stephen Mather and Horace Albright, and was accomplished in spite of strong opposition by the utilitarian Pinchot.

No single individual or event can be identified as the cornerstone to the conservational splurge of the 1930's; rather, it was an accumulation of events--such as the disastrous Johnstown, Pennsylvania, floods and the depletion of Pacific Coast fishery resources--which slowly made both public and government aware of a threatened environment. The convincing tracts of advocates such as soil scientist, Hugh H. Bennett, and conservationist-planner, Benton MacKaye, also gained increasing credibility with the decision makers, Thus, even before the spectacular programs of the New Deal, Herbert Hoover had begun to turn national policy towards a conservation ethic.

> As Secretary of Commerce, he exerted a large influence in the affairs of both the Harding and Coolidge administrations, demonstrating his personal interest in resource policy-making. From his cabinet office in Washington he crusaded for such conservation causes as the regulation of Alaskan salmon fisheries, the control of water pollution, the establishment of fish nurseries, construction of a St. Lawrence waterway, the improvement of inland navigation, and the authorization of the Boulder Canyon project. Once in the White House, he concentrated on flood control, waterways development, and oil conservation. That he was a sincere conservationist is beyond question (Nash, 1968, p. 140).

Because he strongly believed in individualism, Hoover did not strive for stringent federal regulation of resources; rather, he urged cooperation among individuals and agencies involved in these problems.

The first two terms of the Franklin Roosevelt administration saw the initiation of huge national and regional projects designed to combine preservational and utilitarian conservation goals. If these programs were implemented to alleviate unemployment and regenerate a collapsed economy, they also led to tremendous progress in areas such as flood control, integrated resource management, development of recreational lands, soil conservation, and range management (environmental education was sometimes explicit, and always implicit in these programs).

> During the 1930's no resource escaped consideration as a subject for conservation. More significant still is the fact that, although the approach was comprehensive, the record of achievement in the conservation of any single resource surpassed that of any previous administration (Nash, 1968, p. 147).

The impact of the New Deal years on America's environmental policies, as well as its political and socio-economic structure, have been lasting and controversial. Roosevelt's programs were advertised "for the people," and claimed to protect and manage land for the public trust. Significant legislation included the Soil Conservation Act, the Taylor Grazing Act, the Omnibus Flood Control Act, and the Forest Service' "U" Regulations (which applied wilderness preservation policies to the National Forests), not to mention the establishment of major agencies and programs involved in river basin authorities, the Civilian Conservation Corps, the Neighborhood Youth Corps, the Works Progress Administration, and others.

These activities accomplished considerable progress in both environmental management and environmental education (see following sections on Outdoor- and Environment-Based Education). They also placed much greater control of environmental management and decision making in the hands of federal agencies. It was during this period that tremendous regulatory and administrative powers were given, for example, to the Department of Interior, Department of Agriculture, Corp of Engineers, and the Bureau of Reclamation. Thus, the shift to more considered management and planning of environment was accompanied by the creation of a new federal bureaucratic elite in the environmental decision-making field.

The Recent Environmental Period

From past experience, it appears that environmental/conservational cycles in the United States run in periods of roughly a third of a century--20 to 25 years of doldrums in which only a few voices are heard and recognized, followed by 8 to 10 years of frantic activity and commitment. This happened between the Roosevelt eras and again between 1941 and the late 1960's. It is tempting to draw conclusions about periodic impacts of successive generations in this regard, but this is undoubtedly a gross oversimplification.

In any event, another World War and the subsequent rebuilding period again coincided with the termination of an environmentalist period and was followed by a hiatus of activity. When finally a new environmental groundswell began to be felt in the mid-1960's, the causes and the manner of its emergence were quite different than in the past. Firstly, and perhaps most significantly, the new movement had a larger and more diversified public clientele. The movement was still dominated by the highly educated, but America's educated population base had also been expanding. Thus, the highly elitist nature of earlier movements was lessened, although not eliminated. Secondly, the new environmentalists/conservationists led, and not followed, the decision makers in the promulgation of national policies and the drive for new environmental legislation. Thirdly, the efforts and energies of the movement were based in a youthful constituency that was both massive and vocal. If some of the leadership remained with the older professionals and prophets, the guts of the movement moved to young, local leaders and their supporters.

As in the past, however, the seeds had been planted by prophets, often so-called Doomsday types, whose dire predictions began to converge with the escalating problems of modern society: population growth, pollution, high resource and energy consumption, denudation of land, and proliferation of endangered and threatened species.

In the 1950's, this had been seen as an academic argument between "Optimists," such as Kirkley Mather (1945) and Holman (1952), and "Pessimists," such as Fairfield Osborn (1948, 1958) and William Vogt (1948). The first major shot in the new environmental movement, however, was probably Rachel Carson's influential work, Silent Spring (1962). This book expanded the links between the use of chemicals on crops, insects and through a hierarchal structure, to man. The impact of her work was immense in all sectors of life.

> . . . the message of Silent Spring reverberated beyond the pesticide controversy. It was the first "ecological" book to reach a wide audience. In its pages man was shown not only to produce irreversible effects upon his environment, but to be subject to environmental effects as well. For the first time man was coming to see himself in the place of the buffalo, the fur seal, and the plume birds; the passenger pigeon presented itself to gloomier souls.
>
> "There is no question," a government expert on natural resources said, "that Silent Spring prompted the federal government to take action against water and air pollution--as well as against persistent pesticides--several years before it otherwise would have moved" (Graham, 1971, p. 315).

A number of phenomena occurred subsequently. Both academic and popular cultures rediscovered the balance-of-nature principle, particularly through the writings of Henry David Thoreau and Aldo Leopold. Organizations that had previously focused on small special interest memberships, dramatically expanded their memberships and moved forcefully into the national arenas of public relations, legislative lobbying, and judicial advocacy. The Audubon Society, Sierra Club, and National Wildlife Federation are prominent examples. Finally, a new breed of scientific and/or social scientific writer engaged a popular readership. Most were pessimists to one degree or another, and soon the public was absorbing the crisis-laden sermons from the likes of Barry Commoner (1967), Paul and Anne Erlich (1968,70), Stewart Udall (1963), and The Club of Rome (1972).

Impact of the Sixties' Milieu. The converging ideas and actions of the 1960's which became the new environmental movement, cannot be elaborated in terms of simple cause and effect. The tenor and realities of American life in the time between publication of Silent Spring (1962) and the first Earth Day (Ann Arbor, 1968) were extremely complex and it is important to relate the evolution of the new environmentalism to other events taking place. This was a time of increasing internal furor over the American commitment in Vietnam, rising discontent and riots in urban ghettos, and emerging (and often) radicalized student power. All three of these issues were inextricably intertwined as a confused national attempt to re-assess its goals and its actions.

One product of these times was the creation of new and sometimes curious alliances between culturally, politically, and geographically-diverse groups. For example, traditional, upper-middleclass liberals, highly committed and religious conscientious objectors, and ghetto activists sometimes found themselves united in the same cause. It is historical record that these causes often involved civil disorder and other disruptions.

Regardless of how one feels about the era and its issues, it was productive of new and powerful means of group communication and advocacy development. For the first time in many years in the United States, new kinds of forums evolved and the immediacy of modern communication made them easily transferable. It was learned, for example, that one of the most effective ways to counter criticism against a strike or boycott was to balance it with a teach-in. Thus, participation in a learning activity mitigated the breaking of social or educational sanctions. From the point of view of the developing environmentalism of the Sixties', this meant that a new kind of constituency was ready and primed to move into the arena. No longer would the cause of environmentalism and conservation have to rely primarily on an elitest core taken from high government or the affluent. In short, a stronger and broader populistic base was available.

As the most violent or at least the most overt disruptions of the 1960's began to recede (about 1968), cooler heads prevailed and there was a move towards the promulgation of causes that could be viewed in a more constructive sense. Environmentalism became a perfect focus for these new constructive vectors. It satisfied the need to identify and criticize what was wrong--pollution, urban blight, insecticides, landscape degradation--while at the same time providing a positive outlet whereby the community-at-large could define, promote, and even initiate public policy. Thus, by early 1968, the already active and committed voices of environmentalism were beginning to be heard by an already primed and loosely organized grass roots.

In the early phases of this new environmentalism, although the general cause seemed to be a good one, there was difficulty in identifying rallying points which could stimulate the public's imagination and participation. There was a growing general recognition of troubles associated with environment. Defoliation of Southeast Asian landscapes, for example, was introduced as an issue but never really caught on. Similarly, the Torrey Canyon Disaster along the English coastline in 1969 and pollution alerts in Tokyo briefly captured people's attention; but these were issues taking place outside of the United States and presumably lacked personalized impact.

National attention was focused, however, on the question of insecticides and detergent pollution. These two issues, as much as any others, provided general foci leading to the first Earth Day at the University of Michigan in 1968. The idea quickly moved to Madison, Wisconsin, and then began to diffuse across the country. The benchmark events that produced the first highly organized, articulate, and emotionally committed constituencies, however, were probably the January, 1969, Santa Barbara oil leakage and the September, 1969, sale of Alaskan oil leases with the associated commitment to build a trans-Alaskan pipeline. Indeed, it is ironic that oil, which in a sense kindled the environmental flame, has turned out to be largely responsible for later dimming it in its advocacy or non-educational aspects.

As specific issues became rallying points nationally, it was soon recognized that the most effective environmental actions were those that involved the individual citizen and with which he could identify at the local level. Such actions proliferated; but in most cases, local citizen groups found themselves dependent on the established chapters and offices of national organizations for intervention and support.

By 1969, government was beginning to respond with new legislation. Locally, this was often manifested in sign ordinances, returnable container laws, undeveloped space preserves, etc. Broader legislation began to appear at state levels, particularly relating to pollution, constraints on development, and protection of the public domain. The most far-reaching legislation, however, was at the federal level. The National Environmental Policy Act of 1969 (P.L. 91-190) is a landmark in this regard. The purposes of the Act are:

> To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality (P.L. 91-190).

Among major results of this legislation was the creation of the Environmental Protection Agency and the requirement for Environmental Impact Statements. In the five years following the enactment of NEPA, "21 states and the Commonwealth of Puerto Rico . . . adopted environmental impact statements similar to those set in NEPA" (Council on Environmental Quality, 1974, p. 401). Other federal legislation, such as the Water Quality Improvement Act and the Noise Control Act were subsequently enacted.

In the educational realm and growing out of the spirit and intent of NEPA, the Environmental Education Act of 1970 was enacted with its amendment of 1974. This act, which is discussed in detail in Chapter 5, has with its Federal Register interpretations, provided guidance to those seeking definition and support of environmental education.

Education and Environment. In the early stages of the recent environmental period, only a relatively small, knowledgeable core of active environmentalists existed. Most of them were either the already dedicated workers in advocacy groups or academics; most also functioned primarily from disciplinary bases. Thus, as public participation grew, the movement was characterized by an increasing number of tyro environmentalists. Many of these persons were newly committed and unfamiliar with most of the subject matter and processes involved in rigorous environmental analysis; that is, they were emotionally and philosophically, but not operationally, prepared for involvement. Further, they didn't always recognize either the power and potential vested in them, or their limitations. In any event, the need and desire for solid environmental training had become apparent.

Before Earth Day, 1968, it would have been difficult to find many activities, courses, or programs labeled as "environmental education;" it was a new term for most people. This does not suggest that what is currently defined as environmental education had not already been perceived, or indeed practiced, in the past. Charles Van Hise is said to have taught integrated environmental education (under the aegis of conservation) at the University of Wisconsin in the Nineteenth Century. George Perkins Marsh's (1864) delineation of man and nature defined over a century ago the basic core theme of environmental unity; and quasi-integrative policies of the Theodore Roosevelt New Deal eras influenced the environmental education of their times.

A number of factors distinguish the environmental education which began to evolve in the late 1960's. Firstly, there has been both an absolute and proportioned increase in the number of educated persons in the potential environmental education audience (both inside and outside the universities). Secondly, this new audience has a greater willingness to get involved in group and political action than had preceding generations. Thirdly, new methodologies and approaches to knowledge have been developing; that is, there is an increasing integration of intellectual goals and logic on the one hand, with new products of the technological revolution on the other. For example, the development of general system theory is interwoven with the development of sophisticated computer hardware. Similarly, through the use of new instruments and measurement techniques, understanding of energy processes and phenomena has dramatically advanced.

Taken together, the above three factors provide the seeds of core themes for environmental education. Many people have intuitively recognized core themes over the years, although the expression of the themes has been limited until recently. The principal prerequisite to themes for environmental education should reflect the conceptual and content formulations of environmentalism (as defined on page 2.3), with particular emphasis on integration and synthesis. In turn, the Environmental Education Act is a response to this thinking--leading full turn to the realization that the best manifestations of the Law should be through thematic, holistic approaches.

For purposes of this study, five core themes have been selected as critical to the proper integrated implementation of environmental education. They are not the only possible themes nor are they mutually exclusive. It is believed, however, that they represent, at this time, some of the most promising approaches to the field. They are presented and discussed primarily in Chapters 3 and

6. Briefly, they are: (1) General Systems, (2) Environmental Unity, (3) Energetics, (4) Economics, and (5) Human Settlement. All may be either superimposed or integrated into the interdisciplinary patterns demanded by environmental education.

It is realized that many environmental education activities focus on important themes such as air pollution, water quality, land use, resource management, population, etc. These are, however, considered as sub- or secondary themes subsumed by the five core themes.

Given the availability of integrating core themes and the "emergence" of environmental education in 1968 or 1969, two issues should be addressed: (1) What has been the nature and evolution of environmental education in the intervening years, and (2) How well does environmental education relate to core theme ideas and the basic tenets of the Environmental Education Act? These are the essential questions addressed by this entire report. A few comments are appropriate, however, to briefly relate the changing importance of environmental education in recent years.

Environmental Education in Recent Years. With the passage of the Environmental Education Act of 1970, there was a sudden explosion of courses, programs, and activities labeled, in one form or another, as environmental education. Such activities were, for example, rare in elementary, middle, and secondary schools before 1970. In a nationally sampled survey conducted by this project (see Chapter 4), it was found that only 2 percent of schools or school systems which had environmental education programs had initiated those programs before 1965; during 1965-1969, 6 percent initiated programs and an overwhelming 92 percent became involved after 1969. In a more detailed state-wide survey of Arizona (Chapter 5)--which included respondents from formal educational institutions, government, business and industry, social and service clubs, recreational organizations, political organizations, and others--58 percent became involved in environmental education after 1968; but for educational institutions only, the post-1968 involvement rises to 72 percent.

In the higher education realm, this period was characterized by a proliferation of programs under various labels such as environmental science, environmental studies, or environmental centers and institutes. In most cases, these were either "add-on" programs grafted to existing disciplines or colleges within the universities, or loosely formed consortiums between departments or colleges (see Chapter 4). Recent trends in outdoor and/or environment-based facets of the field are discussed in the next section.

As will be shown in later chapters, the range of environmental education activities (at all levels) includes integrating core themes as suggested in this report or mandated in the Environmental Education Act. This is not to suggest that there has been a lack of effort and expenditure in the field; and there certainly has been strong student demand. What has occurred, as will be shown in the data base of later chapters, is that a tremendous proportion of educational efforts in environment have been and continue to be based in the area of already strong ecological, earth, physical, or life sciences. A relatively small percentage of development and training has gone into either the social sciences/humanities role in environmental education or the preparation and presentation of integrative core themes inherent in environmental education.

Summary. The enactment of environmental and environmental education legislation was accomplished with Congressional and Administration leadership often lagging behind public demand. The mandates of this legislation were subsequently refined and reinforced in the courts. Whether this flowering of environmental action was really the wish of the majority of the American public or resulted from sophisticated and vocal lobbying of environmental and ecological interest groups will be debated for some time. In any case, effect seems to have followed cause and the future of environmental management and environmental education has been significantly affected. The prospects for the future, viewed in terms of the successes and failures of this most recent environmental period, are the subject of the last portion of this chapter.

Outdoor or Environment-Based Environmental Education

The history and development of environmental education in the United States is not easily separated from that of the environmentalism and conservation generally. Because they advocate specific views, environmental activities and organizations are inherently educational. It is incumbent upon them continuously toeducate their membership, their potential membership, and the public audiences which they hope to sway. This is true for both the highly specialized groups--which concern themselves with a specific locality, subject or activity--and organizations that operate from a much broader base.

Another truism is that environmental activities in the United States have traditionally emphasized the utilization and conservation of rural and wilderness ecosystems. Nature study and living in nature have always been prominent themes. Even urban-based and urban-oriented organizations have looked inward to the city in terms of parks and other so-called "natural" enclaves.

Thus, once classroom-oriented and philosophical aspects of environmental education are counted, it is not surprising that the main thrust is to environment-based, and often recreational, activities. These have, in fact, often acted as the springboard whereby students enter into a philosophical and advocational appreciation of given environmental positions.

Finally, it should be noted that true environmental education is not an inevitable product of recreational, outdoor-based education. Rather than approach nature as an ecological field laboratory, many groups use nature to promote some set of highly specific aesthetic or religious or lifestyle values; that is, being in nature is a "good" thing, but the acquired value system is the significant product of the experience. There is no question that some important environmental education may be accomplished by these methods, but they should not be confused with the larger objectives and methodologies of the field. The intent here is not to denigrate the motives behind and results of environment-based education. It is historically clear that it has made impressive contributions to environmental progress and is responsible for much of the most effective and long-term training. It is equally important, however, to maintain a realistic perspective between the content of outdoor education and the broader, contemporary understanding of integrated environmental education.

The purpose of this section then is briefly to summarize the history and impacts of outdoor, environment-based activities in the larger context of environmental education. These activities may be conveniently viewed in terms of their sponsors: voluntary and service organizations, government, educational institutions, and the private sector. The nature, pedagogy and extent of many of these activities, particularly in recent time, are discussed in greater detail in Chapter 5. The following sections briefly summarize the historic impact of these activities and place them in an environmental education perspective.

Service and Voluntary Organizations

Voluntary and service organizations have had an enormous impact on both the youths and adults who have participated in them. Much of this stems from the voluntary nature of the financial contributions, group leadership, governing boards, and membership. Included in this category are organizations such as Boy Scouts, Girl Scouts, Camp Fire Girls, 4-H Clubs, Young Men's Christian Association (YMCA), Young Women's Christian Association (YWCA), Boys' Clubs, Girls' Clubs, and a variety of churches and religious organizations (Smith, et al, 1963, pp. 212-213).

Several fundamental characteristics are commom to these groups.

> Their purposes are educational, and their programs are based on learning through doing, generally through activities of a recreational appeal. The adjective character-building has often been applied to these groups; inasmuch as they consider their responsibility to be the personal development of the individual rather than the acquisition of special skills or knowledge (Smith, et al, 1963, p.212).

These goals have been executed through organized camp programs.

Most of the voluntary and service organizations that affect environmental education were formed in the last quarter of the Nineteenth Century and the first quarter of the Twentieth Century (see Figure 2.1). Their growth has been spectacular, and particularly so in the last decade--as evidenced by the selected membership data given in Table 2.1. Many more than doubled their participants in that period; the most dramatic percentage increases, however, are shown by special interest groups who made concerted efforts to "go national" and appeal to a broader population base (e.g., Sierra Club, Audubon Society, Wilderness Society, and the National Wildlife Federation).

The belief that national progress and individual well-being depend on an understanding of the functions of nature has long been professed by organizations such as the Boy Scouts, Girl Scouts, and Camp Fire Girls. The best way to gain an appreciation and understanding of nature, it was thought, was by living in a natural setting. Thus, the scouting groups adopted the idea of summer and weekend camps (Vinal, 1940, p. viii). Camping not only placed one in an outdoor habitat, but also served as a means for augmenting citizenship, cooperative living, community service, character building, and observation with a purpose (Nicholson, 1941). Similarly, and with sponsorship by the Department of Agriculture, the 4-H Clubs were designed to benefit the rural youth. Agriculture, outdoor science, and conservation are emphasized in the camps and meetings.

The impact of such organizations on certain components of environmental education (e.g., nature study, camping and survival, rural husbandry) has been and continues to be impressive. Environmentally-related subjects are the focus of meetings, competitions, and outdoor experiences. Millions of young people gain their major initial access to nature and/or rural America through these groups. During 1964-1974, a time of continuing urbanization (accompanied by increasing rejection by youth of highly-organized, national membership organizations), it is worth noting that the 4-H organization more than doubled its membership and that the various scouting organizations more than held their own (Table 2.1).

In general, urban-oriented organizations such as the YMCA, YWCA, and the Boys' and Girls' Clubs of America have not been as outdoor-oriented as those previously mentioned. These organizations, however, have maintained camps for outdoor education and other reasons. Since 1882, for example, when

TABLE 2.1

MEMBERSHIP OF SELECTED OUTDOOR-RELATED ORGANIZATIONS

Organization	Founding Date	Age Group	1964 Membership	1974 Membership	Percent Change 1964 - 1974
YMCA	1851		4,000,510	7,500,000	+187.5
YWCA	1855		2,166,476	2,400,000	+110.8
Appalachian Mountain Club	1876		8,200	17,500	+213.0
Sierra Club	1892		22,000	140,000	+636.0
4-H	1900	9-19	2,285,600	5,000,000	+218.8
National Audubon Society	1905		41,000	275,000	+670.7
Boys' Club of America	1906	7-20	550,000	1,000,000	+181.8
Boy Scouts of America	1910	8-20	5,430,000	6,512,597	+120.0
Camp Fire Girls	1910	6-18	600,000	600,000	0
Girl Scouts of America	1912	6-17	3,556,000	3,726,000	+105.0
Appalachian Trail Conference	1925		300	8,600	+2867.0
Potomac Appalachian Trail Club	1927			2,280	+100.0
Wilderness Society	1935		21,000	80,000	+381.0
Outdoor Education Association	1940		500	500	0
Girls' Clubs of America	1945	6-18	60,000	150,000	+250.0
National Trust for Historic Preservation	1949		3,635	1,000	-72.0
Izaak Walton League of America	1922		50,000	50,000	0
National Wildlife Federation	1936		51,000	700,052	+1373.0

30 boys from Brooklyn partook of the first outing sponsored by the Young Men's Christian Association, that organization and the YWCA have expanded their operations to include camping programs in every part of the country (Eddy, 1944). It was believed that the camping programs would provide young men and women not only a recreational and religious experience in outdoor living, but also would create a desire to perform constructive services for a better environment (Hopkins, 1951, pp. 469-470).

The goals and accomplishments of such activities cannot be faulted. Along with the camp programs primarily designed by churches and religious organizations for spiritual instruction, this has been a common way by which many Americans have been introduced to the outdoors and nature; that is, the outdoor or nature-oriented camp remains a principal vehicle for one component of environmental education. Over 5 million American youths participate in some 13,000 camp programs annually (Smith, et al., 1963). Although some of these programs are sponsored by government, educational, and private groups (see following sections), the largest participation is from the voluntary and service organizations.

Curricular matters and effectiveness of the camps has varied considerably due to the diversity of purposes among the sponsoring organizations. The length of stay at the numerous camps also has varied from resident camp programs to overnight experiences to short field trips or excursions. However, "all are characterized by adult leadership, a more or less planned program, and educational objectives" (Smith, et al., 1963, 213-214). A generalized description of outdoor camp objectives is presented in Table 2.2. It should be noted that a majority of the activities relate to development of the individual and his life style; the representation of environmental education is subject-specific and does not generally address broader, integrated facets of the field.

TABLE 2.2

CHARACTERISTIC OBJECTIVES OF OUTDOOR CAMPS

Generally, camps promote:

1. Group Living:
   a. Planning - daily activities.
   b. Working - cooking.
   c. Sharing outcomes - meetings.
   d. Assessing - conferences.

2. Democracy:
   a. Respect/dignity for each individual regardless of race, religion, socio-economic status.
   b. Study history of locale - field trips.
   c. Re-enact past - live as pioneers.

3. Health (physical, mental, emotional):
   a. Each cares for washing clothes, showering, sleeping.
   b. Community - care for shelter, equipment, facilities.
   c. Physical recreation: swim; hike; fish; chop wood; row; garden; hunt; games.
   d. Safety:
      1. Use of first-aid kit.
      2. Rules for swimming and boating.
      3. Handling guns and lanterns.
      4. Use of tools and equipment.

4. Appreciation of nature and creative expression:
   a. Observe beauty in nature - form, motion, color, sound, feel - related to birds, animals, insects, flowers, trees, rocks; views of sunset, mist, moon on water.
   b. Listening to bird songs, sounds of creatures, poetry, songs.
   c. Singing at powwows.
   d. Expression through pictures, modeling clay, songs, original poetry or prose, carving or whittling, designing centerpieces.

5. Develop reasoning abilities:
   a. Analyze camp needs and problems - equipment, food, water, type of use of local or individual resources (both tangible and intangible).

Government Supported Environment-Based Education

Federal, state and local governments support outdoor, environment-based environmental education in two ways: (1) by the reservation and/or development of public lands and facilities for environmental or recreational uses; and (2) by providing education programs, primarily on-site. Such programs are usually oriented to the purposes and domain of the involved agencies (see Chapter 4).

This has probably led to some constraints on education program development. The Congressional mandate to the United States Forest Service, for example, makes it the Service's primary business to wisely manage their lands as a timber and grazing resource. Other multiple uses such as watershed management, recreation, and environmental education remain significant, but receive a lower priority and financial commitment. The National Park Service, on the other hand, must delicately balance its commitment between landscape preservation, serious environment-based education, and servicing the large numbers of people who wish to visit the parks and monuments. Also, most government-supported efforts--because of short visitation periods and understaffing--must be limited to short presentations and/or self-guided programs. This is not a question of intent, but of necessity.

Historically, as the frontier vanished, Americans began to reflect on the historic evolution of their country. The desire to preserve some of the physical links and reminders of the past increased. Similarly, individual citizens began to demand the creation of recreation and historic sites shortly after the turn of the century. The request for such amenities could be attributed to several factors. Many people discovered that they felt a need to escape the pressures of an urban-industrial environment when they had the time to do so. Prominent leaders of the day, including Teddy Roosevelt, extolled the benefits of outdoor recreation and experiences, and the time had arrived when citizens realized the value of the scenic wonders of their land and could appreciate its aesthetic appeal. Also, there was a desire to preserve bits of the historic and cultural heritage of their homeland. Thus, the scenario was ripe for government action in the areas of recreation and historic preservation.

As this need for recreational areas became more apparent with population growth and urbanization, federal agencies became more involved in recreation management. Environment-based education immediately followed, both because of its intrinsic value and the need to educate people how to properly use and enjoy the natural landscape. Historically, the most influential education programs were developed by the National Park Service, the Forest Service, and for a brief period, the Civilian Conservation Corps. The Forest Service, for example, has more than 600 organized camps in its domain. The majority of these camps have been owned and operated by various nonprofit organizations and were primarily concerned with outdoor education as it applies to land use management. It is only recently that a larger number of agencies have become seriously active and budgeted in the environmental-based education field.

The National Parks came into their own with passage of the National Park Service Act in 1916, and have since maintained centers for educational and interpretive purposes. They sometimes also sponsor educational field trips. In addition to education, the tasks of the National Park Service include: management of the national parks; maintenance and restoration of the historic sites and monuments; development of recreation areas; and preservation of wilderness (Callison, 1967; Graham, 1971; and Rosenkrantz and Koelsch, 1973.)

The potential for environmental-based education in the national parks is immense. The National Park Service provides expertise through their personnel, educational and interpretive centers and programs, and the park area itself as an outdoor classroom. Visitors to the parks do not have to have the interpretation of the resources, but it is thought to make the visit more "meaningful and enjoyable" and enables one to understand what preservation means and why it is essential. The educational media supplied by the National Park Service assists the urbanites in learning to use and enjoy the parks (National Parks Centennial Commission, 1973).

The government has also sponsored emergency programs, such as the Neighborhood Youth Corps and the Civilian Conservation Corps, which became major purveyors of environmental-oriented education. Both programs provided education through outdoor work and camping. The Neighborhood Youth Corps and emergency flood control funds provided an opportunity for conservation education, employment, and financial assistance for boys to work on stream improvements and pollution abatement in streams and lakes (Swift, 1967, p. 138).

In 1933, President Franklin D. Roosevelt conceived an idea for a dual-purpose federal relief program. He sent a message to Congress calling for the creation of the Civilian Conservation Corps to relieve the "emergency employment situation" and to conserve and develop the nation's natural resources. The stated goals of the program were work-training and character building to be accomplished through projects related to forestry, soil erosion, and flood control (Hill, 1935).

Congress readily approved the measure. Those chosen to serve in the CCC were predominantly young men between the ages of eighteen and twenty-five who had dependents. More than one-half of the participants were from the city, out of school, out of work, and in dire need of economic relief or assistance.

The first CCC camp was set up in Virginia. Of the nearly 2,000 camps operated by the CCC, greater than 75 percent were based in timber areas in national parks, national forests, state lands, and Indian reservations, with the remainder located mainly on prairie lands (Hill, 1935, p.1).

Shortly after the camps were started, educational programs were designed. The programs were not mandatory, but were designed to meet the needs and desires of the men in each camp. As with voluntary and service organization camps, a majority of effort was devoted to development of the individual--with environmental-based or conservation education as a means to these goals. The educational aims were defined as follows:

1. To develop in each man his powers of self expression, self-entertainment, and self-culture.
2. To develop pride and satisfaction in cooperative endeavor.
3. To develop as far as practicable an understanding of the prevailing social and economic conditions, to the end that each man may cooperate intelligently in improving these conditions.
4. To preserve and strengthen good habits of health and of mental development.
5. By such vocational training as is feasible, but particularly by vocational counseling and adjustment activities, to assist each man better to meet his employment problems when he leaves camp.
6. To develop an appreciation of nature and country life.

(Hill, 1935, p. 13).

The accomplishments of the CCC in the field of conservation were tremendous. During the years the CCC was in operation--1933 to 1942--the enrollees planted trees; fought forest fires; built telephone lines, dams, reservoirs, bridges, docks and piers, fences, public use structures; worked in nurseries and museums; restored historic sites; and cleared and developed campgrounds (Graham, 1971). Equal to its accomplishments in conservation practices and the creation of national wealth, the CCC significantly influenced the attitudes and values of the enrollees . . . and indirectly the nation. Young men were indelibly exposed to the aesthetics and benefits of nature. This broadening of their urbanite experience, melded with the travel and cross-cultural impacts of World War II, helped produce a new urban citizen . . . aware of his environmental heritage and oriented to outdoor lifestyles and recreation.

Some CCC veterans later emerged as leaders in the conservation and environment field; large numbers of them actively supported sport and conservation organizations. Most importantly, perhaps, they imparted their values to their neighbors and children and promoted outdoor experiences among them. Indirectly, this may have been a taproot of the 1960's environmental groundswell.

There have been, of course, many other government-supported entries into the environment-based education field (e.g., Bureau of Outdoor Recreation, 1964 Land and Water Conservation Fund Act, and the various state programs), but the Park Service and CCC efforts seem to exemplify the most forceful and influential of these programs.

Educational Institutions

Institutionalized education has provided another medium through which environment-based programs have been executed. Programs for camping and nature experiences have been designed to teach conservation, citizenship, and appreciation of natural landscapes. The inclusion in these programs of scientific concepts regarding the past, present, and future use, misuse, and abuse of the environment have been deemed essential to society (Manley and Drury, 1952).

The responsibility of incorporating the knowledge acquired at school camps in the educational curriculum often has been entrusted to the classroom teachers. In these cases, efforts have been made to correlate the outdoor experiences with specific studies such as geography, mathematics, language, biology, and geology. In other cases, resident staff and enrichment teachers take major responsibility.

Many schools have developed outdoor education and school camping programs for learning activities. The first year-round school camp, established in 1940, was initially under the auspices of the W. K. Kellogg Foundation of Battle Creek, Michigan, and later used as a school for underprivileged children and state wards. Other areas where educational institutions have utilized camps as outdoor laboratories include the Clear Creek School Camp for Los Angeles City Schools; Tyler, Texas; Ann Arbor, Michigan; Cleveland Heights, Ohio, and many more (Smith, et al., 1963). More commonly, however, schools use local centers, nature areas, outdoor museums, and field trips for outdoor-based education.

The thrust of school-supported environmental education has been predominently oriented to work associated with biology, ecology, earth science, outdoor living, and resource management (e.g., fish, wildlife, range, and forest). Few programs have, until recently, dealt with the socio-economic and political ramifications of environment. Also, the more advanced the student, the more likely are the programs to deal with field methods and skills representing a single environmental subfield. These problems are more fully addressed in subsequent chapters.

Private Organizations

Private organizations, as earlier indicated in the historical section, have always played a major role in the environmental movement and educational aspects of it. Such organizations include: (1) Professional societies (e.g., Ecological Society of America, Society of American Foresters, the Geological Society of America); (2) Sportsmen and Recreation Associations (e.g., American Camping Association, Boone and Crockett Club, Izaak Walton League of America); (3) Topical associations (e.g., Save-the-Redwoods League, Ducks Unlimited, Audubon Society); (4) Hiking and mountaineering organizations (e.g., Appalachian Mountain Club, Sierra Club, Seattle Mountaineers, Mazamas); (5) Environmental advocacy groups (e.g., Friends of the Earth, Rachel Carson Trust for the Living Environment); and (6) Private environment-oriented entrepreneurs (e.g., private camps, Outward Bound Programs).

There is obvious overlap in the categorization and the functions of such organizations. The Sierra Club and Audubon Societies, for example, have evolved from emphasizing activities in a highly specialized milieu to their present status, whereby they also perform as major advocacy organizations. All of the private organizations practice one form or another of environmental education, but with the exception of the private entrepeneurs, a large proportion of it is accomplished through their meetings, publications, and public relations programs. Also, in recent years, an increasing emphasis has been given to political and advocacy action programs, by both the relative leftist and rightist constituencies represented in the spectrum of organizations.

Thus, while such organizations have an environment-based raisón d ètre, only a proportion of their activities actually involve outdoor, environment-based programs. Most groups do, however, operate camps, nature centers, or outdoor workshops which emphasize conservation, education, natural sciences, and ecology. In addition, specialized skills and survival training continues in the recreational activities of these organizations: Sierra and Appalachian Mountain Club members continue to hike and climb, National Wildlife Federation members hunt, and Izaak Walton Leaguers fish. Skills education is often involved in these types of activities. Similarly, privately-operated camps have frequently focused their curricula on the development of skills and knowledge, ranging from canoeing and swimming to horsemanship and ecological science.

Recent Developments in Environment-Based/Outdoor Education

Natural environment-based and/or outdoor activities have continued to play a major role in environmental education since the mid-1960's. As previously shown (Table 2.1), the membership in many organizations has grown dramatically over the last decade and the importance of environment-based activities within the total scope of environmental education has remained impressive. In later chapters (4 and 5), data acquired from a nationally-sampled inventory and an intensive survey of environmental education in the state of Arizona provide a picture of the existing content, pedagogy, programs, audiences, and methodologies. Portions of these data which concern outdoor/nature-based environmental education have been extracted and are presented here to define the scope of recent trends.

Outdoor-based activities are considered a medium to achieve important objectives in environmental education for a large number of K-12 programs (see Chapter 4). Table 2.3 presents selected stated objectives of natural

TABLE 2.3

SELECTED STATED OBJECTIVES OF NATURAL ENVIRONMENT-BASED OR OUTDOOR-ORIENTED ENVIRONMENTAL EDUCATION, K-12

For Programs Developed at the School District Level:

For outdoor activities to develop first-hand concepts in the natural environment; skills and enjoyment in outdoor study, living and recreation; positive relationships with other children; and awareness of the area's natural resources (Albuquerque Public Schools, Albuquerque, New Mexico).

To provide learning activities that cannot be structured in the classroom (Paducah Public Schools, Paducah, Kentucky).

Outdoor activities are designed to encourage the development of the concept that all living creatures are products of man's total environment . . . (Paducah Public Schools, Paducah, Kentucky).

For Programs Developed by Groups of School Systems:

Outdoor experiences are an essential part of any environmental education program (Project I-C-E, Green Bay, Wisconsin).

One goal is to redesign educational programs so as to take full advantage of . . . community resources, the community becomes a classroom. This facilitates attitudinal changes of concern toward the environment and a humanizing of the educational process (ECOS, Yorktown Heights, New York).

For State-wide Programs:

You will note that the units are structured to promote learning exercises outside the classroom: on the playground, along the sidewalk, in a local factory, around an area pond, airport, farm, woodland, or in city hall. The learning experiences are conducted in places where students may touch the pulse of community life (Minnesota State Department of Education).

Start an outdoor laboratory, and it will become useful in all subject areas, such as science, mathematics, language arts, social studies, art, music, health, physical education, and industrial arts. Make it a school project. The more complete the plan for development becomes, the more success it will have (North Dakota Department of Public Instruction).

To assist schools in use of the out-of-doors as a laboratory by:

a. Assisting school districts in finding lands, public and private, suitable for use as outdoor labs.

b. Assisting schools in planning the uses of the school grounds or adjacent lands as outdoor laboratories.

c. Assisting schools in developing nature trails.

(Environmental Education Committees in Utah).

TABLE 2.3--Continued

For Programs Developed in Colleges and Universities:

Children do not learn well in isolation from "hands-on" activity in a rich environment drawn from and linked to the surroundings in which they live (Mountain View Center for Environmental Education, Boulder, Colorado).

These curriculum areas in turn will be enriched by the utilization of concrete experiences in the "real world" (Marion College, Indianapolis, Indiana).

The student, throughout different activities in the out of doors, will develop his sense perceptions to a higher magnitude than would have been possible in the classroom (Lincoln Area Environmental Education Project, Lincoln, Nebraska).

For Miscellaneous Programs:

Experiences are often the best medium through which man learns, and thus the purposes of Land Between the Lakes as a national demonstration in outdoor recreation and environmental education are threefold--to create an awareness, to develop understanding, and to stimulate appreciation and concern for one's environment (Environmental Education Center, Golden Pond, Kentucky).

It is not often that students have a chance to work, play, and live together in a situation where they come to grips with their immediate human and natural environment. As a result of this, we hope that they will leave Cispus better prepared to cope with the changing aspects of the world in which they are to live and work (Cispus Environmental Center, Randle, Washington).

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environment-based and outdoor-oriented education programs developed at five hierarchial levels. The most common element of the program objectives is a strong humanistic orientation. For example, the need and desire is expressed for the development of (perceived) untapped human and community resources. Further, there is a tendency to place everyday experiences and habitats fully into an environmental context. In some respects, this is not surprising, given the traditional orientation of many outdoor programs to spiritual and humanistic values. A significant step forward, however, is that emphasis is given in this relationship not only to the traditional nature settings, but also to human settlements and communities. This is a first step, then, towards the development of integrated core themes in an outdoor learning situation. It must be realized, however, that utilization of fully identified core themes, such as the five recommended in this report, remains a goal for the future.

Table 2.4 helps to further delineate the extent of environment-based and outdoor activities in the K-12 systems. A few statistics from the table are particularly noteworthy. Firstly, it is interesting that some 30% of sampled programs considered camping and/or recreation as a major program objective in itself, rather than as simply a vehicle for environmental education. At another level, 23% of the programs view camping as a pedagogic medium; it should be noted that programs developed in the universities and colleges, however, show least interest in this approach. A high percentage of all programs (composite 72%) consider outdoor activity as a significant pedagogic device. Thus, camping and associated nature-oriented activities on the one hand, and a whole spectrum of outdoor activities on the other hand, are being pedagogically applied to enhance learning about environment.

In addition, Table 2.4 illustrates the use of specific pedagogic instruments; i.e., nature trails, nature centers, and outdoor laboratories. If the use of these three types of facilities are at least partially viewed as mutually exclusive, upwards of 50% of the respondents are utilizing outdoor situations and 30% at the very minimum use true nature sites. Of course, a large percentage of the outdoor laboratories may also be located at nature sites and the strong emphasis on outdoor laboratories suggests an evolving orientation toward skills development and possibly a technological orientation. Again, this shows promise for increasing development of integrated themes.

TABLE 2.4

CHARACTERISTICS OF NATURAL ENVIRONMENT-BASED OR OUTDOOR ENVIRONMENTAL EDUCATION, K-12 (PERCENTAGE RESPONSE)

Camping/Recreation as a Program Objective

Program by:	School System	27
	Multi- School System	25
	State	2
	College or University	11
	Miscellaneous	64
	Composite	30

Use of Camping as a Pedagogic Medium

Program by:	School System	28
	Multi- School System	25
	State	19
	College or University	11
	Miscellaneous	24
	Composite	23

Use of Outdoor Activity as a Pedagogic Medium

Program by:	School System	75
	Multi- School System	92
	State	68
	College or University	83
	Miscellaneous	52
	Composite	72

Use of Nature Trail

Program by:	School System	13
	Multi- School System	25
	State	13
	College or University	0
	Miscellaneous	8
	Composite	12

Use of Nature Centers

Program by:	School System	20
	Multi- School System	33
	State	10
	College or University	11
	Miscellaneous	24
	Composite	18

TABLE 2.4—Continued

Use of Outdoor Labs

Program by:	School System	32
	Multi- School System	33
	State	26
	College or University	50
	Miscellaneous	16
	Composite	30

Other than traditional disciplinary participation (at both graduate and undergraduate levels), there is a general absence of outdoor orientation in higher education (Chapter 5). Some divergence from this tendency is found only in a few undergraduate environmental education programs (as distinguished from general awareness courses).

Organizations outside the formal education network show the heaviest interest in outdoor educational phases of environmental education from two sectors: environmental organizations and governmental organizations (see Chapter 5). Community-based outdoor and recreational organizations also display heavy commitment to environment-based education. Business and industry, professional and labor associations, and private foundations show little to no participation in outdoor-oriented education. Only private and public environmental organizations are heavily committed to outdoor-based aspects of environmental education at both the national and local levels. Government commitments are strongest at the local level, while the proportion of government or environment groups which feature outdoor education is limited at state and regional levels.

The nonschool organizations in some cases show a strong proclivity towards integration and thematic approaches. Environmental organizations at both national and local levels regularly mix natural and social sciences in their outdoor-oriented programs. Only one class of organization regularly attempts to integrate natural systems, social systems and issue involvement. This is the major environmental organization type operating at the national scale. Beyond the environmental organizations--i.e., government, business, industry and others--there is a definite tendency to emphasize the natural sciences in nature-oriented situations.

Summary

If the role of environment-based environmental education has been an historically significant one in the development of the national environmental consciousness, it has also tended to be a somewhat specialized role. A huge proportion of the environmental movement in the United States has been maintained by the nature-oriented and outdoor recreational sectors. They have not, however, been much concerned with urban and suburban environments of the complex decision-making processes involved in environmental protection and management. They thus represent only a portion of what is characterized as environmental education in the Environmental Education Act of 1970 and the Proceedings of the 1972 Stockholm Conference. Undoubtedly there are areas in which their educational programs could present a more integrated educational view of environment (see Chapters 1, 6 and 7), but it must also be recognized that the environment-based organizations, in their specialized way, have been perhaps the most competent and effective proponents of wise environmental management and environmental education.

CHAPTER 3

PERSPECTIVES AND THEMES FOR ENVIRONMENTAL EDUCATION: 1975

The status of environmental education in 1975 is, at best, ambiguous. In the five years since the passage of the Environmental Education Act of 1970 and in the six years since the passage of the National Environmental Policy Act of 1969, both national and citizen appraisals of the importance of environmental action, legislation, and education have altered dramatically. Depending upon whose side one was on, it used to be a simple matter to identify the "white hats" and the "black hats." At the present time the issues are not as clearly defined in the eyes of either the public or professionals.

The urge to explain the present status of environmental education in simple cause and effect terms is tempting. But as any environmental educator knows, reality is never simple; rather, it is made up of complex interacting processes and phenomena. If one is to address the status and make recommendations for the future of environmental education, it is also necessary to take a look at some of the causal factors that operate in American society.

It is apparent that the rosy future of environmentalism, as perceived in the late 1960's and early 1970's, has not been entirely realized. How did this happen? The following paragraphs attempt to identify some of the processes that have been at work. They should be read with the recognition that some portion of the responsibility for partial failure lies in the environmental education community itself. In later sections of the chapter, however, a more positive view is taken. Core themes, which may facilitate integrated approaches to environmental education, are suggested.

3.2

Problem Areas

Communication Nongap

Communication gaps are often blamed for a lack of public understanding of issues. It is difficult to fault the mass media in this respect during the blossoming of the most recent environmental movement. Press and television, in fact, participated in an orgy of environmental and ecologically-oriented presentations. No corner of America, no age group, no educational or income level was spared. Little known environmental writers and academics became overnight television celebrities. Magazines vied for the latest doomsday features on pollution, the population explosion, food supply, and landscape deterioration; the public was smothered by oilspills, pipelines and threatened species.

The miracle of modern communications reached every segment of American Society and quickly spread to the international arena. Some nations quickly leapt on the bandwagon; others viewed it as just another imperialistic plot against the third world. Even the "turned off" could not turn off. They were surprised by Arthur Godfrey's environmental homilies in the midst of a soap commercial or Hugh Downs' erudite and ecological salesmanship on behalf of Ford Motor Company. Even musical variety show hosts could not resist the inclusion of little anti-pollution commercials in the midst of their programs.

The problem was that it was all too good to be true. America had found an environmental religion, but the sermons came too superficially, intensely and heavily. Thus, long before energy was a major public issue, a huge proportion of the population had tuned out simply because they were supersaturated. Since the mass media recognized the importance of ratings and sales, they quickly turned to other audience-attractive issues, and have since devoted amazingly little time to serious environmental questions.

The Ecological Gimmick

Environmentalism held a promise for intelligent, interdisciplinary, and integrated policies and methodologies which would make America a more harmonious ecological place in which to live. If the way had been found (it has, of course, been philosophically posited time and time again), no one bothered to inform most of the public or professional community. Environmental education and action was exemplified by slogans and gimmicky campaigns and too often, entire communities were up in arms over issues such as returnable bottles, while larger environmental issues languished.

This is not to put down Smokey Bear nor the need for container recycling and clean streets; it is rather depressing, however, to realize that the principal presentations of environmental management to the public was purveyed primarily through Johnny Horizon, bumper stickers and the Pitch-In campaigns. The adult population, which is so essential to the implementation of environmental education, has (in spite of the opinions of critics) a limited receptivity to campaigns aimed at the ten-year-old mind. The gimmick-laden campaigns were and are intrinsically useful efforts, but they should have been only a small part of a broader, more sophisticated campaign.

Defending the Disciplinary Homestead

One of the most serious problems faced by environmental education has been the persistence of barriers to truly interdisciplinary and integrated education. The structures of schools, universities, and even textbook sales departments have been historically oriented to a disciplinary reward system; the higher the educational level, the more prevalent has been this practice. The recent shifts towards interdisciplinary environmental education have been impeded by a combination of such factors. These include the fact that promotions, pay, and peer approval are usually based on performance in one's disciplinary field. Further--because institutional hierarchies tend to be inertially self-perpetuating and can be altered only by prolonged and complicated procedures--the majority of the schools and colleges avoid the development of innovative new programs which might require restructuring of the institutional organization chart or loss of disciplinary enrollments. This is one reason that some of the most successful, or at least inventive, environmental education programs have appeared in newly formed schools. Also, and perhaps most significantly, a majority of educators have no experience in interdisciplinary communication and do not possess the common vocabularies and concepts necessary for effective interaction.

The above problems are essentially due to inertia and inexperience within educational systems. A less pleasant barrier to integrated work has been the perpetuation of disciplinary jealousies in many institutions and the reluctance of most administrators and teachers to risk "giving up something" to another field. Symptomatic of the urge to defend the disciplinary hearth is the claim by any number of disciplines (or at least some of their membership) that environmental education is properly "their" field and that they should be the primary purveyors of any new program. Unhappily, the next paragraph also reflects similar human foibles.

3.5

Money, Grants and the Environmental Bandwagon

For a brief period of time, environmental studies and environmental education appeared to be a new mother lode for expert grantsmen and entrepreneurs. Many sincere and worthy research and educational projects were of course funded. Unhappily, there was also a fair number of people and organizations who hypocritically used the environmental boom as a means to support the same kinds of research and teaching that they had been doing right along. It was rather reminiscent of the old "cut out, get out" philosophy of the early American timber industry--only this time federal and foundation funds were the "stuff" of the harvest. Almost everyone in the environmental field is familiar with at least one such incident involving considerable sums of money. The perpetrators are now back at their same old stalls and environmental education has been doubly punished; no real environmental gains came from the investment and the funds were not used more usefully elsewhere.

At another level a large number of all organizations dealing with environmental education (formal and nonformal) operate at a local or small-scale in terms of financial support and available human resources. Consequently, the programs developed and promoted by such organizations tend to emphasize limited issues within their operational scope. Thus, the overall picture is often made up of many fragments which are not integrated in any formal way. A positive result of this situation, however, is that excellent specialized environmental education is often accomplished with low funding and few personnel.

Depth Versus Breadth

Serious intellectual and academic questions are raised by the concept of environmental education. Any field that hopes to successfully integrate concepts and information from both the social and natural sciences faces the depth-versus-breadth dilemma. If an integrated understanding of the complex processes and phenomena involved in environment is expected, and within the normal educational span, the risk exists that teachers and graduates may be glib generalists. Conversely, a rigorous indepth education in the fields of environment does not leave time to develop the necessary environmental overview. This argument has been a persuasive factor in the slow development of environmental education. It may, however, be a specious argument in that the problem may be overcome by extending the educational period (as is sometimes done in the fields of architecture and engineering) or by more effectively defining the systematic, scientific, and common languages of environment.

Energy, Environment, and the Economy

No discussion of the problems of environmental education is complete without reflections on the American economy and energy supply. Emotionalism has been a regular, and probably unnecessary, by-product of the recent environmental period. Unfortunately, opposing advocacy groups have tended to label environmental issues in terms of "good guys" and "bad guys;" the public has responded accordingly. Just as a more sensible middle ground was emerging the problem reappeared. A combination of decreasing fossil fuel supplies and a recessional economy reopened the old argument between the resource exploiters and the environmental protectionists. This time the public scales tipped away from the environmentalists, and indirectly the cause of advocacy-based environmentalism lost ground. At the same time, a tightening economy militated against investment in new educational programs.

State of the Arts

Finally, it must be recognized that environmental education remains an unfulfilled field. It is still in the process of development and evolution. While the basic goals of environmental education are fairly well defined (e.g., PL-91-516), no commonly accepted methodology, pedagogy, or body of subject matter has been agreed upon. Some subfields of environmental education have been strongly developed; these tend to be those based in the natural and physical sciences. Their integration with other subfields required for environmental education remains only partially fulfilled (see later chapters).

The areas relating to the humanities, social sciences and political forces that affect environmental management and decision making remain weakly developed. While a few specialists and courses exist in these areas, no concensus has been reached regarding their precise relationship to and method for integration with other subfields of environmental education and environmental studies. Until such time as this occurs, these fields will lag behind the natural sciences, environmental education development will be handicapped, and the teachers of teachers so necessary to growth of the field will not be effectively achieved.

If the environmental field still has problems defining and/or realizing its educational product, it also is encountering barriers in the employment marketplace. In the late 1960's and early 1970's, it was claimed that a new job market was opening in the environmental field--one in which broadly-trained environmental managers and generalists would play an important role in the planning and decision-making processes. Such opportunities have not been realized. Indeed, only a few such positions were advertised and they were quickly filled. Most employers still looked to discipline-oriented specialties and profess suspicion of broadly-trained environmentalists. College graduates lacking a disciplinary expertise continue to encounter difficulties in the environmental employment field.

Favorable Trends

If environmental education has experienced some problems in recent years, there have also been many favorable developments. Many funded programs have been successful at the local, state and federal levels (see, for example, Chapters 1, 4, 5, and 6) and a remarkable amount of effective environmental education has been accomplished voluntarily at the grass roots level or with low funding. Furthermore, a large proportion of these accomplishments have been achieved outside of the regular institutional settings, indicating the high potentials for citizen groups, service organizations, and business and industry in environmental education. Such developments are very much in the spirit of the Environmental Education Act.

It is also obvious that interdisciplinary work is receiving greater credibility and support. Many funding agencies now require interdisciplinary teams in environmental research and education, and new interdisciplinary journals have been started. Many students now seek cross-disciplinary education as do a number of researchers. At the same time, more teachers are gaining experience in integrated team teaching efforts, and are beginning to pass on their experiences to others.

Although employers still tend to favor discipline-based personnel, large organizations (e.g., public utilities, city planning commissions, and resource-based industries) are more frequently developing environmental planning departments or sections, which both promote environmental education and make functional use of environmentally-trained personnel. If this trend is maintained, opportunities for environmentally-educated professionals should open up.

At another level, the constituency for environmental education has changed. More students and young adults have received at least a modicum of training in the environmental field, and are amenable to further and more sophisticated instruction. Much of the emotionalism has disappeared and student environmentalists are willing to pursue more rigorous training in the field. One positive result of the energy and economic situation has been the recognition that environmental management must somehow balance the material and economic needs of society with the wise and careful stewardship of the land. Hopefully, this will lead to increased support for environmental education and an integrated and realistic approach.

Realities of Implementation

Any perspective of environmental education must take into account the realities which are encountered in program implementation. This is a complex issue, both because the environmental field is inherently complex and because the process by which new policies and actions are introduced involves a complicated set of judgments and criteria; that is, the infusion of environmental education and its associated values into existing systems is accomplished through a tortuous decision-making process.

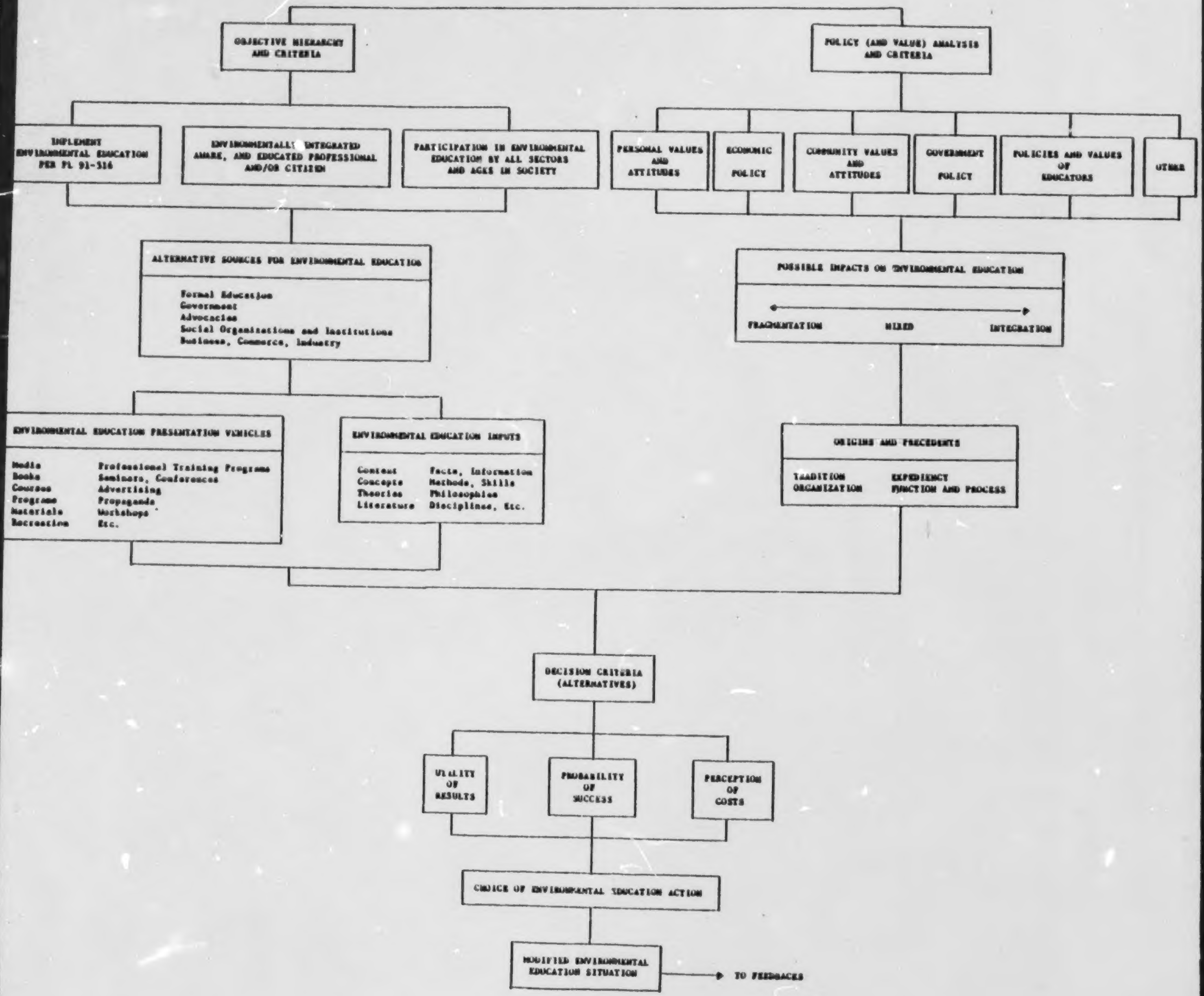
This process is described herein by use of a schematic situation model (Figure 3.1). The model systematically identifies and synthesizes the criteria by which an existing situation for environmental education is modified. Two interrelated processes lead up to the decision-making process and implementation of an environmental education action: (1) the hierarchy and criteria which may be objectively described and assessed, and (2) the complex policy and value criteria to be analyzed.

The situation model is broadly defined and may be applied to a variety of environmental education scales, time periods, and subjects or pedagogies. It is essential, however, that this broad scope be acknowledged and at least partially developed if a meaningful understanding of the implementation process is to be obtained.

The objective hierarchy (again, Figure 3.1) uses word boxes to describe three overriding objectives that might be involved in the introduction of any environmental education action. Some of the factors which can be objectively defined and should be considered are illustrated in the three lower boxes. Firstly, the alternative sources from which environmental education activities may be initiated are listed. These include the impact source sectors developed in later discussion of the Environmental Education Act (Chapter 5). Secondly, the hierarchy must consider the vehicles--such as media, books, and workshops--by which environmental education can be presented. Thirdly, any environmental education action must deal in objectively defined inputs such as content, philosophy, and skills.

The right-hand side of the diagram has to do with policy analysis and judgment of merit; elements which are, in general, subjective. The relationship of policy analysis is particularly critical in the development

FIGURE 3.1


OBJECTIVE HIERARCHY AND CRITERIA
POLICY (AND VALUE) ANALYSIS AND CRITERIA
IMPLEMENT ENVIRONMENTAL EDUCATION PER PL 91-516
ENVIRONMENTALLY INTEGRATED AWARE, AND EDUCATED PROFESSIONAL AND/OR CITIZEN
PARTICIPATION IN ENVIRONMENTAL EDUCATION BY ALL SECTORS AND AGES IN SOCIETY
PERSONAL VALUES AND ATTITUDES
ECONOMIC POLICY
COMMUNITY VALUES AND ATTITUDES
GOVERNMENT POLICY
POLICIES AND VALUES OF EDUCATORS
OTHER
ALTERNATIVE SOURCES FOR ENVIRONMENTAL EDUCATION
Formal Education
Government
Advocacies
Social Organizations and Institutions
Business, Commerce, Industry
POSSIBLE IMPACTS ON ENVIRONMENTAL EDUCATION
FRAGMENTATION
MIXED
INTEGRATION
ENVIRONMENTAL EDUCATION PRESENTATION VEHICLES
Media
Books
Courses
Programs
Materials
Recreation
Professional Training Programs
Seminars, Conferences
Advertising
Propaganda
Workshops
Etc.
ENVIRONMENTAL EDUCATION INPUTS
Content
Concepts
Theories
Literature
Facts, Information
Methods, Skills
Philosophies
Disciplines, Etc.
ORIGINS AND PRECEDENTS
TRADITION
ORGANIZATION
EXPEDIENCY
FUNCTION AND PROCESS
DECISION CRITERIA (ALTERNATIVES)
UTILITY OF RESULTS
PROBABILITY OF SUCCESS
PERCEPTION OF COSTS
CHOICE OF ENVIRONMENTAL EDUCATION ACTION
MODIFIED ENVIRONMENTAL EDUCATION SITUATION
TO FEEDBACKS

of a situation model involving multiple alternatives to environmental education. Ultimate decision-making must account for the values and attitudes propounded by the individual, the community, the educational sector, and other value-formulating sectors of American society. Furthermore, it must be recognized that the origin of these policies and attitudes may have roots in tradition, organizational arrangements, and functions that have been based on a more restrictive use and/or understanding of environmental education. The range of environmental choices--across a fragmentation/integration continuum--is immense given the range of permutations of value, attitude, and policy.

The analyses of objective and policy criteria are continuously interrelated during the process leading up to actual decision making. Eventually, they converge on specific decision criteria (i.e., alternatives), which are conditioned in turn by assessment of the utility of results, probability of success, and perception of cost. The term "perception of cost" is taken in the broadest sense and does not refer solely to economics. Eventually a choice of environmental education action is achieved which leads to the new and modified situation. Feedback follows with further alterations in the system.

Case Examples

As in all systems, the situation model is a schematic and possibly oversimplified version of reality. Each of the boxes can be further refined in terms of complex subsystems. The constraints and complications involved in decision making for any given environmental education action are great.

Three such case examples are briefly discussed herein: (1) the problem of school level implementation; (2) problems in government; and (3) decision-making by the individual.

The implementation level, that is, those persons who directly impact the target audience, is critical for the success of environmental education. In the formal education system the implementation level is represented by the school system and its hierarchical components. Ostensibly, it should be relatively simple to infuse a new program at this level; one merely needs to convince the school board that it should vote to implement an environmental education program and this policy is then ordered down through the hierarchy to administrators, curriculum coordinators, teaching teams or departments, and, finally, the individual teacher. Unfortunately the change process is not a simple matter of sending policies down through the hierarchy because, as in every type of human organization, the values and attitudes of the people at any level in the system can prevent implementation.

Two levels in the school district hierarchy are especially critical for change. First, the school board and the administrators must be convinced of the merit of the innovation. Second, and most important, the individual teachers must believe in the program, and perceive it as something more than merely another curricular policy handout. One of the best ways to obtain the grass roots support of classroom teachers is to involve them in the design and implementation of the potential program.

Policy constraints are also influential in the way that government agencies treat environmental education. Nowhere, except in the Office of Environmental Education, is environmental education a primary mandate of government agencies. On the other hand, a huge array of agencies (e.g., EPA, USFS, TVA, BLM, SCS, NASA) have subsidiary programs in the field. The evolution of environment-related education is affected in two ways. Firstly, there is an unplanned and uncoordinated proliferation of efforts, which often overlap and possibly even contradict each other. Secondly, each agency's information and education policies necessarily reflect the vested interests and mandates of the agency. This is not necessarily bad, but it does suggest that an agency's educational staff would be wise to avoid confrontations with their own organizational objectives. If, for example, a hypothetical agency's primary mandate is to manage and regulate the use of a particular resource, it is unlikely that the agency's information and education office will, through their educational media, suggest policy discussions (no matter how rational) inconsistent with the existing position.

A final example of problems associated with implementation and/or modification of programs is that of acceptance and understanding by the individual. This is the ultimate grass roots level and may be exemplified, for example, by the teacher, the student, the parent, or the individual school board member. Each individual has a personal value system that has been formed from different perceptions, attitudes and beliefs. These in turn have been influenced by external factors such as culture, community, and family. Efforts to influence the individual, therefore, are doomed to failure if they do not take into account the personal value system that affects choices and will lead to successful feedback through the existing culture and value system.

3.15

Core Themes in Environmental Education

The Need for Core Themes; Introduction and Background

Given that the acceptance and implementation of any environmental education program or activity is beset by attitudinal and institutional impediments, it is wise to consider ways by which environmental education can be accomplished with both greatest effectiveness and least resistance. Evidence suggests that the near future will see little change in the institutional and decision-making forums in which environmental education should, or does, operate. Most suggestions or recommendations, therefore, should accommodate the realities of both formal and nonformal education realms; and core themes should, if possible, be divorced from disciplinary identities which inhibit their broader implementation. The remainder of this chapter focuses on the identification of such themes or core ideas, which hold promise for broad application to environmental education in the United States.

Indeed, the single most disturbing criticism of existing environmental education, and one which probably has done more to restrain development of the field, is the claim that environmental education does not possess core methodologies and themes which make it distinctive from the disciplines that surround it. This is probably valid insofar as a large proportion of what purports to be environmental education is really an aggregation of vaguely related subject matter from other fields. In the larger view, however, this position may be a red herring that is distracting the environmental education community from establishing clear-cut programs on a broad front. Time and again the cry for integration is heard, but very few people or institutions seem to be getting down to the business of defining and utilizing those themes.

In the past year, for example, some six years after Earth Day, the cry for themes and integration is still heard at national and international levels. At the 1974 Spokane, Washington Conference on the Environment, Congressman Thomas Foley found it necessary to remind the audience that with the passage of the National Environmental Policy Act and the Environmental Education Act, "Each government agency rushed off in all directions to establish their own programs," and . . . "now we need to regroup, reconstitute, organize, and reduce redundance to acceptable levels." Earlier in the year (June 4-7) the Runsted, Denmark Conference on "Environmental Education at Post-Secondary Level: Review of Experience--Future Action," addressed similar problems. A study, covering 85 public universities in North America, was presented to the delegates and noted that there was no model organization for managing environmental study programs at the post-secondary level. Yet many of the 70 environmental educators from 16 countries were, according to Arden L. Pratt (1974), primarily interested in seeking a form of integrated nontraditional program within the traditional educational framework and were looking "towards the United States for leadership in this area."

It is further symptomatic of this need that the public sector perceptions of the Law and its interpretations have not, as late as 1974, brought forth a large body of effort that addresses central core themes--themes representative of either the full intent of the Law or the intent of many of the writers and scholars who influenced the rhetoric of the Law. Thus the Federal Register in 1974 reiterates the call for synthesis between disciplines and the need for issue orientation.

> Thus the environmental education process is multifaceted, multidisciplinary, and issue or problem-oriented. Otherwise worthwhile but specialized and narrowly defined educational approaches, such as traditional learning approaches to such areas as conservation and resource use,

> environmental science, nature study, outdoor education, or sex education, which normally tend to exclude consideration of mutually reinforcing social, physical, cultural, and policy implications of these concerns do not meet the scope and purposes of the Act. While an environmental education project supported under this part could draw upon some of the ideas and materials of these traditional subject areas, it could do so only in synthesis with ideas and materials from a number of other subject areas, including social sciences, technology, arts, and humanities as appropriate and needed for the area of inquiry. (Federal Register, Vol. 39, No. 21, 30 January 1974)

On the other hand, there is a large body of literature which expressly addresses the missing themes of environmental education. It is prominent, for example, in a century of writing in geography, ecology, and planning. The key words in these works are often the same that figure so significantly in the Environmental Education Act and its interpretations: "integration" and "synthesis." The problem historically has been one of finding effective methodologies to "integrate" and "synthesize" in a meaningful way. It does appear, however, that approaches devised in the last decade or so--such as systems analysis and energetics--may possess the interdisciplinary utility and transferability that has been lacking in the past and it is probable that such core-oriented methods may represent the means to proper expression of environmental education and its associated legislation.

The Need for Core Themes: The Environmental Education Act

Environmental education must be interwoven into the fabric of both P.L. 91-516 and core environmental thought. It is not the intent here, however, to define and discuss the Law and its relationship to core ideas in great detail. The Law is discussed more thoroughly and related to national and local data bases in later chapters (4, 5, and 6). Because the Law and core themes hold a reciprocal relationship, however, it is necessary to schematically isolate a few of the attributes of the Law as background to the following sections. Accordingly, in Figure 3.2, selected quotations from the Environmental Education Act of 1970 and the Federal Register (1974) are arrayed against a schematic illustration of some critical flows and components related to environment.

In the matrix (again Figure 3.2) man and the environment have been arrayed according to three selected views. The first view is a simple categorization of natural, human, and technological systems. Secondly, these same levels are delineated in terms of a typical traditional view (e.g., Marquis, 1968; McHale, 1970; Roszak, 1972). Thirdly, an ekistical description is provided for each of the levels (Britz, 1972; Doxiadis, 1968; Riles, 1973). Finally, each of the three levels is characterized by key words and phrases taken from the Environmental Education Act, P.L. 91-516. Cutting along the base of the vertical columns is a key descriptor of the Environmental Education Act. Also, because a major objective of the Law leads to an integrative, synthetic, or holistic approach, the diagram schematically utilizes interpretations taken from the Federal Register as instructions leading to integration as a core of environmental education.

By looking at the Environmental Education Act (Volume II, Exhibit 9.1) and selected excerpts from the Law and Federal Register (Figure 3.2), it appears that some fundamental alterations to the established model of education are required. The Environmental Education Act emphasizes integration and synthesis rather than continued differentiation of specialties, suggesting that the main task at this time is to synthesize patterns that may be prescriptive rather than to separate into special compartments knowledge and action which has been mainly descriptive. Obviously, this goal has great impact on any and all activities which act under the guise of improvement of the environment. The Law and its interpretive guidelines do seem to seek a balance, denouncing neither the

FIGURE 3.2 SYSTEM MATRIX

	Traditional View	Ekistics View	PL 91-516
Techno Systems	Technical Materials and techniques; mechanical, physical, chemical tools; organized systems of tools and processes; extraction/production/construction, etc.	Shelters Housing, community facilities, city centers Networks Public utility systems, water, power, sewerage Transportation systems, road, air, rail Communication systems, computer and information systems, physical lay-out (plan)	Pollution Resource Allocation Technology Transportation Urban and rural planning
Human Systems	Psycho Social Interpersonal relations, individual and collective behavior patterns Social Institutions Kinship, religious, political, economic, recreative, cultural, educational	The Individual (Man) Physiological needs, safety and security, affection, belonging, esteem, self realization, knowledge and aesthetics Society Public administration and the law, social relations, population trends, cultural patterns, social hierarchy, economic development, health and welfare	Population Economic Impact
Natural Systems	Environmental Atmospheric-air, water, radiation, energy and gas cycles Lithospheric-plant and animal organic population-mineral cycles Hydrospheric-plant and animal organic population-water cycles	Nature Climate, water, soil, plants, animals, geology, topography, environmental analysis, resources, land use	Conservation Resource Depletion

FR: "Environmental education activities . . . demand as well that the tools of the various disciplines be used in a highly integrative manner."

FR: "Emphasis shall be placed on the development of skills and insights needed to understand the structure, requirements, and impact within and among various environmental entities, systems and subsystems."

FR: "The intent of the process is to 'involve participants in inquiries into both the specific and general environmental implications of human activities and their short and long range effect on societal resources and general public policy.'"

FR: "Each environmental education activity partakes of particular aspects of these areas (disciplines, institutions, environmental concepts and problems), fusing them in a manner that makes a greater comprehension and understanding of contemporary environmental issues and problems possible by bringing about deeper awareness of relevant interrelationships . . ."

Integration
Synthesis
Holism,
etc.

FR: "The areas (environmental inquiry) themselves are separately defined for the sake of convenience only; in reality, they are all interconnected. It is this interwoven quality and the balances and relationships among areas that environmental education deals with."

Law: "The term 'environmental education' means the educational process dealing with man's relationship with his natural and manmade surroundings, and includes the relation of population, pollution, resource allocation and depletion, conservation, transportation, technology, economic impact, and urban and rural planning to the total human environment."

NOTE: "FR" indicates Federal Register, Volume 39, Number 21, 30 January 1974; "Law" indicates PL 91-516.

sciences nor the arts, but calling for a dynamic interaction between them and integration of similar dualities.

Themes in Overview

It has been earlier illustrated (Chapter 2) that the Environmental Education Act, not to mention the National Environmental Policy Act, was the product of converging attitudes and goals during the most recent surge of environmentalism. It is significant that there is nothing espcially new or innovative in the rhetoric of the Law or the methods suggested to accomplish its purposes. These are old ideas and themes, regenerated and given new life because of public and political support. What is new is the expression of these themes and goals in the body of federal legislation and the concomitant implication that ideas previously promulgated by a relative few, and received by a limited audience, are now in the public domain.

There is some danger of confusing chickens and eggs in this situation. The Law, by virtue of its legislative and administrative existence tends to become a "forcing function" for definitions of environmental education. It must be remembered, however, the Law is nothing more than the product of a pre-existing body of thought, which remains the critical knowledge base in the development of environmental education.

Thus, to understand the Law and its implications, it is also necessary to understand the basic tenets on which it was founded. If it is accepted that the Law is derivitive of broader principles and methodologies concerning man, his works, and nature, this study is ruled by a basic assumption: that the environmental field generally, and environmental education specifically, are addressing such a complex and interacting set of processes and phenomena that environmental education must be analogously viewed as a reduced scale version of the larger human condition and its intellectual and technological relationship to nature. In other words, to identify the core themes of environmental education is also to identify already-existing themes that have been posited at a broader level. It is useful, therefore, to briefly assess the larger world view in order that environmental education be placed rationally within these contexts. This is pursued in some detail in Chapter 6, but is briefly stated here before moving specifically to the realm of environmental education.

The cyclical view of environmental developments in the United States (discussed in Chapter 2) is in principle, if not exactly in timing, analogous to the general development of knowledge and its methodologies. The history of learning is replete with examples of the convergence of innovation and goals on certain critical themes and ideas. Thus, what at first is fragmented and isolated--and often hidden by disciplinary barriers or lack of receptive audiences--may suddenly gain currency through interdisciplinary cross-pollination, publications attractive and comprehensible to the larger public, and the need of scientists, managers, and decision-makers to find more viable models or methods to accomplish their work.

The rapid diffusion of Darwinian principles and perspectives is an excellent example of one idea whose time had come and which quickly spread from biology to be incorporated into such diverse fields as climatology, geomorphology, and political science. Indeed, the concept of evolutionary, organic growth was eventually held responsible for everything from Nazi Lebensraum policies to climatic change.

More recently, in the writings and research of the 1960's and 1970's, much effort has been focused on the development of new models and frameworks which might provide foundations for the understanding and manipulation of processes and phenomena in both the natural and human realms. The hearths of these activities are often identified with disciplinary bases (e.g., mathematics, engineering systems control, biology, economics), but in reality the most useful results have been those which have a high degree of transferability and can be operated effectively within an interdisciplinary context. By either intent or accident, the innovators have strengthened the foundations and potentials for interdisciplinary effort.

A wide variety of core themes and methods have emerged in this way. At the broadest level there have been impacts from position papers and philosophical discussions (e.g., Boulding, 1956; Bruner, 1960; Kaplan, 1964; Kuhn, 1970; Leopold, 1949; Platt, 1970; Popper, 1959). General system theory, with all its spin-off applications and ramifications, has probably had the greatest impact across the broad spectra of both management and academia (e.g., Churchman, 1968; Emery, 1969; Forrester, 1968; Fuller, 1971; Laszlo, 1973, 1974; McHale, 1969; Mesarovic, 1970; von Bertalanffy, 1968; Weiss, 1971; Yearbook of the Society for General Systems Research, 1956-1972). In applied areas, there is a large literature dealing with applications of systems and other theories which tends to be discipline-based. Examples are found in the natural systems (e.g., Beer, 1965; Chorley & Haggett, 1967; Haggett & Chorley, 1969; Odum, 1971; Rosen, 1970; Watt, 1966, 1973); cultural and behavioral systems (e.g., Buckley, 1973; Miller & Rice, 1967; Miller, Galanter, & Pribram, 1960; Piaget, 1971; Skinner, 1971; von Bertalanffy, 1967); and technological systems (e.g., Barras, 1972; Dewan, 1969; Doxiadis, 1968; Halprin, 1971; McHarg, 1971; Meadows, Behrensill, Meadows & Randers, 1972; Shannon & Weaver, 1949).

Five Core Themes

The definition of selected core themes for environmental education is derived then from an appreciation and an understanding of the larger prevailing core themes. Five key ideas and/or approaches are identified and recommended herein. All fall under the aegis of what might be labeled content/concept themes. They are derivitative of general systems, energetics, economics, environmental unity, and human settlement.

A number of possible themes have been by-passed. It is believed, for example, that any further promotion of the "multidisciplinary-team teaching-overlapping circles-subject matter specific" syndrome is to move up a blind alley. In this regard, a serious flaw in most attempts to initiate environmental education is the tendency to try and mesh fragmented pieces of the disciplinary jigsaw puzzle--without having properly identified the glue that holds the pieces together. Although there are instances where traditional institutional frameworks have been replaced (as will be seen in later chapters), the fact remains that most existing organizational structures have been, and probably will be, sustained. To use a composite of fragmented themes from each component of the system as the core for environmental education is simply to replicate the problems that already exist in the fragmented system itself. This is epitomized in the structure and organization of most institutions of higher learning. On the other hand, since the prevailing institutional structures are likely to continue, core themes for environmental education must be established which can be supplementary or supplantary or integrative; that is, they should be adaptable to the spectrum of institutional systems that exist in the United States.

Additionally, it is not the purpose in this section to delineate and discuss all of the existing sub- or secondary themes that exist in environmental education. Subjects such as air pollution, population, water quality, land use, etc., are perfectly appropriate foci for the development of environmental education programs and activities; the specific focus theme is, in fact, the most commonly occurring one in environmental education (see Chapters 4, 5, and 6) after discipline or mixed discipline-based programs. The broader themes recommended herein encompass the various specific focus themes and, as will be noted in later chapters, are presently used less frequently.

The five core themes that follow are not the only possible themes nor are they mutually exclusive. Three of them (general systems, environmental unity, and energetics) are, in the project's estimation, the most important umbrella themes. Two of them (economics and human settlements) are critical, but in a sense can be subsumed under the other three. In any event, all of the themes, including general systems, can be viewed from a systems perspective and any combination of the five themes is viable. An expanded discussion of the core themes--which are briefly discussed here--is given in Chapter 6.

Environmental Unity. Environmental unity--that concept which states that all processes and elements of the environment are interrelated and interdependent, and that change in one leads to a change in all others--is the most long-lived core theme in environment-related studies. This theme has been the essence of the naturalists' and the environmental scientists' message from Thoreau (1850) and Marsh (1864), through Man's Role in Changing the Face of the Earth, (Thomas, 1956), to Commoner (1967, 1971) and Ward and Dubos (1972). It is the underlying foundation for hundreds of geography and ecology courses at all levels and has been variously manifested in regionalism, land use studies, and planning. Most significantly, environmental unity has been the driving, underlying concept in practically every version of conservation, environmentalism, or modern resource appraisal.

Environmental unity remains the most commonly accepted theme of environmental education. Unfortunately, the theme is given more lip service than substance--except insofar as it appears within interdisciplinary aspects of natural sciences such as ecology or physical geography. The important roles of man and man-built environments in the environmental complex has tended to be supplementary rather than integrative; that is, the roots of environmental unity remain in the natural and physical science firmaments.

One reason that a successful integrated (man/land) version of environmental unity is not in common use is that there has been difficulty in deriving a systematic, integrating methodology. Witness, for example, the partial failure of earlier efforts at regionalism in geography and area studies programs nationally (Burton, 1963; Kohn, 1970; McNee, 1967). It now appears that implementation is more realistically possible by virtue of more recently developed methodologies, especially those expressed in general systems theory and energetics. Thus, it is believed that this core theme: (1) must be sustained; (2) must be expanded to include man and his works in a meaningful and understandable way; (3) should remain one of the major foundations of environmental education; and (4) should be presented in the context of newer, systematic (rather than fragmented) concepts.

The General Systems Approach. It is recognized that there are at least two levels at which to view and utilize systems. On the first level, and the one that is perhaps most generally applicable to environmental education, the systems approach has its greatest value in providing a rationale and means whereby complicated systems (such as environments) can be logically defined and described--thereby forcing the teacher/student to identify the significant elements and interactions within the system. This approach can be used by almost anyone if it is presented according to the rudimentary cybernetic objectives originally cited by Wiener (1948): inputs, process, outputs, feedback, and controls (see expanded discussion and diagrams in Chapter 6). The "attributes" of the system (what is in the boxes) and the "relationships" of the system (linkages between the boxes) are relatively easy to define at the descriptive level.

A second and more sophisticated level requires rigorous use of mathematical tools, matrix algebra, and linear programming. This approach is exemplified by the professional who uses systems analysis in problem solving. This is also important in the resolution of environmental problems and provides an excellent medium for teaching research design which leads to identification of environmental alternatives and a rationale and anticipatory decision-making process (Mesarovic and Pestel, 1975). Its uses, however, will characteristically fall into the advanced classes and programs.

General systems principles--of which information flow is a subset critical to environmental analysis--is essentially the idea of reposing problems in terms which permit alternative ways of perceiving reality (Meier, 1962; Shannon and Weaver, 1949). Systems principles and methods have the distinct advantage that they are highly transferable from discipline to discipline or can be used between disciplines. In addition to this horizontal transferability, they can be applied vertically (with varying degrees of sophistication) to different age or learning levels.

The use of systems methods, both in the design of environmental education curricula and the structural organization of that curricula, has also presented certain economic advantages. The approach is economically sensible because (1) it promotes synergistic efforts which eliminate unnecessary redundancies of intellectual effort and human energy and (2) it promotes dollar savings through the elimination of organizational and disciplinary redundancies. Finally, and perhaps most importantly, the systems approach enhances the identification of a maximum number of alternative choices in environmental decision-making.

Because this new "interdiscipline" is not so much concerned with drawing boundaries around existing disciplines, but with extending their territories so that they overlap and interpenetrate each other, it stimulates a more effective synthesis of knowledge. Thus, it is an ideal medium in which to treat environmental education, both in terms of its intellectual derivations and the expression of the Environmental Education Act.

It is obvious that this is not an attempt to define a series of implementation processes for a systems approach, but rather a sermon on its potential efficacy for environmental education. The approach has been successfully used in a variety of fields and it is incumbent upon environmental educationists to explore and determine ways to more universally apply it. Indeed, a few successes have been accomplished in this regard and are cited and discussed in Chapter 6. Lastly, it must be recognized that although the general systems approach is one of five possible core themes that are recommended in this chapter, it is not exclusive of the others and can provide a framework within which the others may function.

Energy Flow. Energy is at the same time one of the most venerable and most rapidly expanding themes for man. Practically every discipline has been concerned with the workings and quantities of energy that are present in the world--but specifically from the perspective of each discipline. Thus, the physicist may be interested in energy as a potential or kinetic ability to do work, which explains the movements of planetary bodies or the mysteries of quantum mechanics. The average citizen has historically viewed energy as something he or she has or has not got a lot of, and more recently, as something related to an exhorbitant utility bill and an impending crisis. The biologist, on the other hand, may see energy in terms of photosynthetic processes or the biomass gains and losses that may be traced through a given food chain, while the economist may view energy by way of capital and operational costs in production and delivery systems.

Yet, suddenly energy has become a focal theme for a diverse population, This heterogeneous population--which may be in business, scientific, or consumer sectors--probably does not even hold common definitions for energy and uses the expression with a variety of nuances. The average non-scientist, for example, is probably confused by such terms as "latent energy" and "chemical energy" and is likely to believe that energy is some kind of "stuff"--that is, an element or phenomenon rather than a process. Nevertheless, there are common attributes of energy that are becoming more generally recognized. Firstly, regardless of the type of energy (e.g., chemical, radioactive, mechanical, heat, etc.) or the materials through which it is flowing or in which it is stored, energy can be described and explained in a common language; that is, the units by which it is measured. Secondly, it is common to all materials and organisms that energy is stored, used, and/or flows through them.

Lastly, there is a third point that energy may be viewed as a "forcing function" in essentially every area of nature, human activity, and man-built environments. Climatologists, for example, will argue that the earth's atmosphere system is driven by solar energy and the behavior of the earth's energy balance. The zoologist will account for biomass in terms of energy consumed and expended, while the transportation industry is literally dependent on the transformation of energy to propel all vehicles.

Taking these three commonalities into account, fewer educators are worrying about energy only from their own personalized perspectives, and are instead using energy flow models to explain a variety of integrative, environmental processes and phenomena. Thus, both the carbon and life cycles, for example, can be explained in energy-dependent terminology. At the same time, especially in the United States, there is an emerging awareness of the broader implications of energy in all its forms and its impact on human activity.

If it is apparent that energy is not a new subject, it is still one that has received and deserved rather special treatment in recent years. It has already developed as a fashionable approach in a variety of disciplines, as reflected in a number of texts and articles (e.g., Gates, 1971; Watts, 1974) and especially H. T. Odum (1971). As familiar as the theme may be, however, the use of energy models and energetics in environmental education has not been fully and appropriately exploited, although some applications have been generated (see examples in Chapter 6).

Further development of an energetics core is recommended because it not only provides a theme focus, but also because it provides a conceptual perspective which combines the principles of general system theory, the analytical techniques of economics, and the basic laws of the physical sciences. Furthermore, it provides a rational basis of policy and decision-making through the ability to integrate, correlate, and quantify complex factors in a single analytical framework, using energy as the basic unit of analysis.

Economics. Considering that economics plays an overwhelming role in political and environmental decision-making processes, it has been a tardy discipline entry into the environmental field (Andersen, 1974). It is, for example, in the 1974 amendment (P.L. 93-278) and not the original Environmental Education Act of 1970, that economics is singled out as one of the major foci for environmental education activities. Part of the blame must be placed on the economists themselves; in academic realms, for example, few economists have considered the environmental area sufficiently important to occupy their time. Conversely, environmental advocates and/or managers have often considered economic costs as trivial barriers to environmental and conservational accomplishments.

The necessary melding of environment and economics is now finally on the horizon. Although the marriage has been inevitable (if slowed by reluctant partners), the process has been accelerated by recent economic events in the United States. A combination of recession on the one hand, and the increasing cost and tightening supplies of energy sources on the other hand, have brought the interrelationship of economics and environment forcefully into the public decision-making arena.

It is, therefore, appropriate that economics serve as a thematic core in environmental education. It has the advantage of expression through system methodologies, can be treated through a process orientation as in cash flow, and cost/benefit analysis is a common denominator in almost any environmental decision-making process. Furthermore, the assessment of environmental economics is one of the best ways to develop integration between natural and socio-economic systems, while orienting the educational process to both issues and decision-making alternatives.

Human Settlement. Human settlement is the most complex, integrated system involving man and the environment--and it is through settlements that man has most dramatically impacted and altered the face of the earth. In the United States, human settlement is primarily manifested in urbanized places, where in excess of 80 percent of the population resides. If urban sites are the focus of the greatest human activity, they are also the nodes of the greatest cultural and environmental disturbances. Cities are the sources of the heaviest production, concentration, and diffusion of pollution; as well as the greatest disturbances of run-off and drainage, climate, soils, topography, and fauna and flora.

The man-built environment has literally reordered and restructured the natural scene, but the man-built environment of human settlements also exerts its own environmental impact on the behavior of the inhabitants and the ambience in which they function. Thus, the ways in which humans plan, construct, and manage their settlements affects both the emotional and physical environments for the inhabitants.

Although human settlement is obviously a major connective thread in environmental education, it has usually been addressed implicitly. It is noted elsewhere in this report (Chapters 2, 4 and 5) that for environmental education generally, the greatest emphasis has been placed on the natural and physical sciences, with least attention given to socio-economic and political areas. The evolution of our knowledge and study of settlements, however, has been occurring in exactly the opposite way. There is, not surprisingly, a large literature concerning the structure and form of settlements and the behavior and location of people in them (e.g., Eldredge, 1967; Gottman, 1961; Mumford, 1961; Yeates and Garner, 1971). Only recently has the physical and natural setting been given serious consideration or integrated into our understanding of human settlements (e.g., Detwyler and Marcus, 1972; Legget, 1974; Stearns, 1974). The utilization of a human settlement core in environmental education must focus on such man/environment syntheses.

It is also clear that greater emphasis is now being placed on the qualitative aspects of human settlements. This was emphasized, for example, at the 1972 Stockholm United Nations Conference on the Human Environment; and the 1976 Vancouver United Nations Conference on Human Settlements will address general and scientific knowledge of this issue as a thematic focus. While this humanistic and socio-economic thrust is emerging, most natural and physical scientists continue to focus on more scientific urban themes such as air pollution and water quality. A broader man/nature environmental view is intruding, however, through the requirements and mandates of environmental impact statements (see, for example, Environmental Protection Agency, 1973, Studies in Environment, 5 Volumes; or Dickert, 1974).

Thus, the human settlement theme is an appropriate one in both conceptual and applied terms. It can be formulated within either a systems or economic framework, and is related to a number of important subthemes of environmental education such as land use, pollution, and population.

It is important to note that the human settlement theme, as with all the other themes that have been cited, may stand alone as a focus for environmental education programs or activities. But most effectively, each of the themes can be interrelated to the others through a rational use of systems methods.

Summary

Many favorable developments have occurred in environmental education in recent years, but they have been tempered by a series of national and local problems. Environmental education is inherently a complex subject, which in turn must be infused through a complex and sometimes emotional decision-making process. It is, therefore, unrealistic to expect instant and always favorable results.

The realities of the existing educational and societal systems is such that many constraints and barriers inhibit implementation of new ideas or programs. Educational experience indicates that innovations originating at high levels in the hierarchy (e.g., federal government) are not easily imposed on the broad population pyramid unless a climate of acceptance exists at the grass roots level. This is one reason (see Chapters 1 and 4-6) that some of the most successful environmental education has been accomplished by organizations that reflect either the homogeneous attitudes of the local school and community on the one hand or the bonds of special interest organizations on the other. The decision-making process is, in these cases, simplified because people have been brought together through common values and perceptions.

The potential for environmental education is at the critical juncture where it may either continue and grow or stagnate through the inability to implement its tenets. This situation--whereby environmental education needs to be approached concurrently from the top and bottom lines of the hierarchy--must be recognized as a principal context of the analyses, conclusions, and recommendations of this report.

Furthermore, environmental educators must strive to eliminate fragmentation and develop a more integrated and synthesized set of core themes. Five such themes have been suggested in this chapter: environmental unity, general systems, energy, economics, and human settlement. They are further developed by way of examples (Chapter 6) and recommendations (Chapter 1).

Chapter 4

THE NATIONAL SURVEY:
METHODOLOGY AND GENERAL RESULTS

Introduction

A major part of the total project effort centered on a survey inventory of existing environment-based education programs in the United States. The objectives of this survey were threefold: (1) to identify a typology of existing environmental education programs; (2) to develop a profile for each identified type; (3) to generalize about the current status and trends in the existing environmental education system, with a view towards making recommendations for change and improvements.

Four Task Forces were identified and assigned responsibilities as follows: (1) Elementary Schools; (2) Secondary Schools; (3) College and University; (4) Non-school (Outdoor-Oriented) Programs. The task groups were charged with obtaining current information on the environmental education system in accordance with the overall objectives. It was agreed that each Task Force would obtain the following types of information on environmental education programs falling within their area of responsibility:

1. Information on the type of organization (school district, corporation, addresses, names of key personnel, date of development of programs, etc.).
2. Characteristics of the target population (age, level of education).
3. Geographic information on extent of program and problem focus.
4. Disciplines involved.
5. Type of cross-disciplinary organization, if any.
6. Extent of man-environment emphasis.
7. Types of skills development emphasized.

8. Pedagogy utilized.
9. Program objectives.
10. Extent of outdoor orientation.
11. Program's ability to be transferred and implemented elsewhere.
12. The career orientation of the program.

It was agreed that with respect to defining environmental education programs that the general strategy would be to examine all programs identifying themselves as engaging in environmental education. Thus, programs entitled conservation, outdoor education, nature study, man-environment, geography and other likely candidates were also examined.

Survey methods used were specific for each Task Force, because each Task Force faced different problems in respect to program identification, number of organizations involved, and data available. Bibliographic searches utilizing ERIC computer-generated files as well as manual procedures were used to supplement survey data.

Although the Task Force groups were allowed to independently pursue subject-specific methodologies, a number of actions and objectives were held in common. Firstly, there was the responsibility to obtain information within a common typology (e.g., the twelve informational objectives listed above). Much of this was accomplished by the TEEP (Types of Environmental Education Programs) Form. Secondly, it was apparent that the four and one-half months available for the individual Task Force surveys permitted only a sampling of environmental education programs and activities in the United States. Every effort was made, however, to obtain appropriate geographical, organizational, and target population distributions in the sample. Altogether, some 1,186 programs and organizations were queried.

With respect to the presentation of Task Force findings, little attempt has been made to promote parallelism or consistency between style and format. Rather, the conclusions were designed to draw findings together in a more cohesive fashion. The combination of the elementary and secondary Task Force reports reflects, despite the division of workload between two teams, the realities and difficulties involved in identifying the division between the two levels of instruction and the fact that many programs surveyed have K-12 targets.

The College and University TEEP report focused on the evolution of varying types of programs and courses in environmental education relating it to the normal structure and composition of college and university systems. The Outdoor-oriented Task Force, which had to deal with a diverse and fragmented population, emphasizes wide variety of programs, focus, scales, organizational base, and activities.

Secondary and Elementary Education: Types of Environmental Education Programs

In order to provide the raw data with which to analyze and classify environmental education programs in the elementary and secondary schools, information was solicited from a large number of sources. Individuals active in environmental education were contacted, school systems were surveyed, and known programs were examined. In all, information was queried on 645 programs in 48 states; 193 responses were elicited from 44 states. In other words, useful information was obtained from approximately 1/3 of the queried population. Materials obtained were examined in detail and information from them was encoded on the TEEP (Types of Environmental Education Programs) Form. (Appendix A).

The elementary and secondary environmental education programs were categorized on the basis of the administrative origins of the program--i.e.:

Programs developed at the School District Level; Programs developed by groups of School Systems; State-wide programs; College and University programs; Commercial programs; Miscellaneous programs; and Nation-wide programs.

The School District Type

This type includes single schools (within a district) and school districts, county units, as well as unified county districts (Table 4.1). More than half of these programs had received some sort of federal funding with which to develop, implement, or carry out part of their environmental program, or to develop and publish environmental education curricular materials. One-third were primarily dependent upon local sources, and only a few obtained funding from the state level. Most programs of this type were begun after 1970. There is a strong tendency for these "programs" to feature the creation and dissemination of teachers' guides having a fairly consistent format.

The elementary programs, in general, stress teacher input and enrichment.

At the high school level, school districts view environmental education as supplementary to the "normal" discipline-oriented curricula. This suggests the "homeroom" structure at the elementary level, and the discipline structure at the high school level, influence the orientation of environmental education and discourage truly interdisciplinary environmental education.

Very few of the programs were carried on outside the boundaries of an individual school district. Surprisingly, relatively few emphasized environmental problems outside their local area. Because many of the programs prepared by school districts are done as guides and frameworks, the question of transferability does not arise; nearly all can be transferred. Almost all are meant to be adapted by teachers to fit their own interests and situation and these programs can be modified to fit almost any locale.

TABLE 4.1

SUMMARY CHARACTERISTICS OF ENVIRONMENTAL EDUCATION PROGRAMS (PERCENTAGE RESPONSE[1]):

COMPOSITE SCHOOL DISTRICT

Size of Sample = 60

Dates Operation Began		Disciplinary Affiliation		Skill Development (Techniques)		Objectives	
Pre-1965	- 0%	Interdisciplinary	- 25%	Technical, Lab, Outdoor	- 73%	Informational	-100%
1965 - 1969	- 8	Multidisciplinary	- 35	Communicative	- 27	Camping/Recreation	- 27
1970 - Now	-92	Conservation	- 8	Human Relations	- 33	Skills	- 80
Teachers' Guide	- 80%	Ecology	- 28	Camping	- 32	Behavior/Value/Attitudinal Change	- 75
		Other	- 13	Problem Solving	- 82	Teacher Awareness	- 2

Transferability of Program		Target Population		Extent of Program/Problem Focus			Environmental Problems Stressed			
Yes	- 33%	Elementary	- 26%	World	- 0%	2%	Social	-57%	Political	- 18
Yes, But Must Adapt	- 63	Secondary	- 37	National	- 0	10	Economic	-22	Other	- 7
No	- 4	K-12	- 42	Regional	- 2	12	Biological	-80	Man/Environment Focus:	
		Teachers	- 78	State	- 15	20	Chemical	- 7	Totally	- 17%
		Community Groups	- 7	Local	- 90	88	Physical	-70	Partially	- 73
		Special	- 3				Geographical	-38	None	- 8

Pedagogy			
Lecture/Text	-45%	CAI	- 0
Inquiry/Problem Solving	-77	Simulations/Games	- 10
Additional Insights	-23	Camping	- 28
Evaluation of Alternatives	-33	Outdoor Activity	- 75

Outdoor Orientation

Field Trips: Urban 23 Industry 8 Rural 45 Wilderness 10

Problem Location: Urban 17 Industry 15 Rural 38 Wilderness 7

Sites: Nature Trail 13 Nature Center 20 Outdoor Lab 32 Other 8

Mobile Units 3 Camping 18

Career Orientation

Yes (Career Education) 7 Yes (Education for Careers) 0 No 93

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[1] Because of overlapping goals or objectives, percentages do not necessarily add up to 100%.

Groups of School Systems

The programs developed by groups of school systems include multiple-district and/or multiple-county areas that may or may not cross state boundaries (Table 4.2). Most of these programs have or have had federal funding, all were initiated after 1970, and all but one program of this type feature teachers'guides.

The largest number of programs of this type address themselves to all levels, from K-12. The local view prevails in both the "extent of the program" and "problem focus" for this type, and to date, a world/national view of environmental matters has not been widely implemented or infused into existing environmental education materials.

This intrastate type is similar to the "school district type" in terms of content and methodology. Nearly all of the programs stress both biological or physical aspects of the environment, while about 2/3 stress the geographical and social aspects of environmental problems. Economic and political aspects of the environment receive even less emphasis on this type than in the school-system type. The tendency to separate the social, political, and economic aspects of environmental concern is reflected in the man/environment aspect of most programs of this type.

Like the school system type, there is considerable emphasis placed upon problem solving. Emphasis on technical skill development and outdoor activities was, however, somewhat greater. Also there seems to be a considerably greater emphasis placed upon some of the less traditional teaching techniques; e.g., inquiry, simulation, and skill development in the human relations area.

As with the school system type, respondents for these regional programs indicate that they stress information transfer, skill development, and behavior/

TABLE 4.2

SUMMARY CHARACTERISTICS OF ENVIRONMENTAL EDUCATION PROGRAMS (PERCENTAGE RESPONSE[1]): INTRASTATE REGION

Size of Sample = 12

Dates Operation Began	
Pre-1965	- 0%
1965 - 1969	- 0
1970 - Now	-100

Teachers' Guide - 92%

Disciplinary Affiliation	
Interdisciplinary	- 42%
Multidisciplinary	- 67
Conservation	- 0
Ecology	- 8
Other	- 8

Skill Development (Techniques)	
Technical, Lab, Outdoor	-100%
Communicative	- 25
Human Relations	- 58
Camping	- 17
Problem Solving	- 83

Objectives	
Informational	-100%
Camping/Recreation	- 25
Skills	-100
Behavior/Value/Attitudinal Change	- 92
Teacher Awareness	- 0

Transferability of Program	
Yes	- 33%
Yes, But Must Adapt	- 67
No	- 0

Target Population	
Elementary	- 25%
Secondary	- 17
K-12	- 83
Teachers	-100
Community Groups	- 35
Special	- 30

Extent of Program/Problem Focus		
World	- 0%	17
National	- 0	8
Regional	- 17	42
State	- 8	42
Local	- 100	100

Environmental Problems Stressed			
Social	- 67%	Political	- 42
Economic	- 17	Other	- 0
Biological	-100		
Chemical	- 17		
Physical	- 83		
Geographical	- 58		

Man/Environment Focus:	
Totally	-33%
Partially	-50
None	- 8

Pedagogy			
Lecture/Text	- 83%	CAI	- 0
Inquiry/Problem Solving	-100	Simulations/Games	- 50
Additional Insights	- 25	Camping	- 25
Evaluation of Alternatives	- 75	Outdoor Activity	- 92

Outdoor Orientation

Field Trips: Urban 67 Industry 58 Rural 75 Wilderness 0

Problem Location: Urban 50 Industry 50 Rural 50 Wilderness 0

Sites: Nature Trail 25 Nature Center 33 Outdoor Lab 33 Other 1

Mobile Units 0 Camping 17

Career Orientation

Yes (Career Education) 17 Yes (Education for Careers) 8 No 75 value/attitudinal change objectives in their programs. The regional type appears to place somewhat greater emphasis on the latter two objectives, than is the case with the school system type; yet none of the programs has a specific unit or set of materials dealing with value clarification. This is in spite of the inclusion of objectives which would seem to suggest such an orientation.

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[1] Because of overlapping goals or objectives, percentages do not necessarily add up to 100%.

As in the school district type, al of the programs could be utilized by other schools, either as they stand, or with some minor modification. Thus, transferability and implementation in this type appears to present no serious problems if other schools or systems wish to adopt the programs.

State-wide Programs

The state-wide programs examined reveal that nearly half of these were funded solely by the state, and a similar number indicated either total or partial dependence upon federal funds. Nearly all of these programs have been developed since 1970. About three-quarters of these programs feature the creation and dissemination of teacher guides. The format arrangement of these guides is similar to that described previously, and again these guides serve to provide teachers with environmental awareness as well as activities, materials, and lesson frameworks (Table 4.3).

Programs of this type are K-12 programs, or at least they have developed materials which imply a K-12 range. A large proportion of the programs have elements which are intended to be used for community (nonschool) groups, but there are no elements or adaptations of any program for special education groups.

As might be expected, a large proportion of these programs are state-wide in extent' but a few (usually oriented around one site) were local. The problem focus has been expanded in some of the programs: most include regional

TABLE 4.3

SUMMARY CHARACTERISTICS OF ENVIRONMENTAL EDUCATION PROGRAMS (PERCENTAGE RESPONSE[1]):

STATE LEVEL

Size of Sample = 31

Dates Operation Began

Pre-1965 - 6%
1965 - 1969 - 3
1970 - Now - 91

Teachers' Guide - 84%

Disciplinary Affiliation

Interdisciplinary - 45%
Multidisciplinary - 61
Conservation - 10
Ecology - 6
Other - 0

Skill Development (Techniques)

Technical, Lab, Outdoor - 71%
Communicative - 39
Human Relations - 42
Camping - 19
Problem Solving - 77

Objectives

Informational -100%
Camping/Recreation - 23
Skills - 77
Behavior/Value/Attitudinal Change - 84
Teacher Awareness - 0

Transferability of Program

Yes - 65%
Yes, But Must Adapt - 35
No - 0

Target Population

Elementary - 32%
Secondary - 32
K-12 - 52
Teachers - 84
Community Groups - 32
Special - 0

Extent of Program/Problem Focus

World - 0% 10%
National - 0 29
Regional - 0 58
State - 74 81
Local - 19 71

Environmental Problems Stressed

Social -74%
Economic -48
Biological -77
Chemical -48
Physical -77
Geographical -68

Political - 65
Other - 0

Man/Environment Focus:

Totally -39%
Partially -61
None - 0

Pedagogy

Lecture/Text - 65%
Inquiry/Problem Solving - 71
Additional Insights - 26
Evaluation of Alternatives - 65

CAI - 0
Simulations/Games - 48
Camping - 19
Outdoor Activity - 68

Outdoor Orientation

Field Trips: Urban 32 Industry 32 Rural 42 Wilderness 3
Problem Location: Urban 32 Industry 32 Rural 42 Wilderness 3
Sites: Nature Trail 13 Nature Center 10 Outdoor Lab 26 Other
Mobile Units 0 Camping 3

Career Orientation

Yes (Career Education) 10 Yes (Education for Careers) 3 No 87 scale aspects and interrelations of environmental problems; some discuss national level aspects, and world scale interactions of environmental problems. As with other types, a perspective of the world and nation as integral structures within which environmental problems arise is almost totally lacking in all of the programs.

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[1] Because of overlapping goals or objectives, percentages do not necessarily add up to 100%.

With respect to content and methodology, the statements made for the school district type can be applied for this type also. Due to the broad nature of materials emanating from the state level, one part of a large program might be interdisciplinary, another part multidisciplinary, and a third part perhaps taught by a single discipline. Unlike the district and intrastate types previously discussed, the social and physical realms are much more equally represented in this type. In at least two-thirds of the programs there is representation from social, natural and physical sciences. Also, there is a greater emphasis on the study of man as a part of his environment.

The skill development and pedagogical orientations of these programs are not significantly different from those of other types. The stated objectives are also quite similar to those of other types of programs, except that somewhat more explicit attention is given to objectives of outdoor education and value-attitudinal change.

As with the other types, all of the programs and their materials could be transferred and utilized by other states or school districts as they stand or with some modifications. Implementation presents equally few problems for the average school district or state.

Three states presented materials which included career orientation and all three included careers education.

The completeness of the orientation varies drastically from simply stated goals to "Handbooks on Careers relating to the Environment" which includes identification of old and new occupations relating to the environment; determination of manpower supply and future needs; development of teacher-training programs; and a listing of existing programs in the state colleges and universities.

It is of some interest to note that the status of environmental education planning by the states does not relate significantly to the character of state-originated environmental education programs or whether or not the state has adopted an environmental education plan (Table 4.4).

College and University Programs

Programs developed by college and university personnel to be used by the elementary and/or secondary schools generally are funded at the federal or state level.

All but one of the programs has evolved since 1970, and nearly all featured teachers' guides (Table 4.5). The teacher guide approach as usual, calls upon the teacher to expand the contents found within the guides.

The largest number of this type address themselves to K-12 programs. A few attend the needs of community groups, but none is concerned with special education. The majority of these programs have state-wide extent. A distinctive characteristic of this type of program is the tendency towards a wider range of problem focuses. Most deal with problems which transcend the local scene, and several emphasize global aspects of environmental problems.

With respect to content and methodology, this type is similar to those previously described; that is, only a few are truly interdisciplinary in orientation, and the human/nonhuman separation in the treatment of environmental problems is maintained. As in the case of the state-originated programs, there appeared to be a somewhat better balance among the disciplines represented.

TABLE 4.4

THE STATUS OF ENVIRONMENTAL EDUCATION PLANNING BY STATES

Plans Adopted By Legislature	Plans Adopted By Administration	Plans Being Considered	No Plan Action
Florida	Alabama	Illinois	Georgia
Minnesota	Michigan	Tennessee	Indiana
Mississippi	Ohio	Wisconsin	Kentucky
North Carolina	Missouri	Iowa	Arkansas
Texas	Connecticut	Massachusetts	South Carolina
Nevada	Alaska	New Hampshire	Kansas
Oregon	California	Rhode Island	Louisiana
Washington	South Dakota	Colorado	Nebraska
Virginia		Montana	New Mexico
New Jersey		Utah	Oklahoma
New York		Wyoming	Maine
			Vermont
			Hawaii
			Idaho
UNKNOWN:			North Dakota
Delaware			West Virginia
District of Columbia			Pennsylvania
Maryland			Arizona

Since: 1973

TABLE 4.5

SUMMARY CHARACTERISTICS OF ENVIRONMENTAL EDUCATION PROGRAMS (PERCENTAGE RESPONSE[1]): COLLEGE AND UNIVERSITY

Size of Sample = 18

Dates Operation Began

Pre-1965 - 0%
1965 - 1969 - 6
1970 - Now - 94

Teachers' Guide - 94%

Disciplinary Affiliation

Interdisciplinary - 28%
Multidisciplinary - 39
Conservation - 6
Ecology - 17
Other - 11

Skill Development (Techniques)

Technical, Lab, Outdoor - 67%
Communicative - 50
Human Relations - 67
Camping - 11
Problem Solving - 78

Objectives

Informational -100%
Camping/Recreation - 11
Skills - 83
Behavior/Value/Attitudinal Change - 89
Teacher Awareness - 0

Transferability of Program

Yes - 67%
Yes, But Must Adapt - 28
No - 5

Target Population

Elementary - 22%
Secondary - 28
K-12 - 44
Teachers - 94
Community Groups - 22
Special - 0
College - 6

Extent of Program/Problem Focus

World - 0% 17%
National - 6 44
Regional - 17 61
State - 50 61
Local - 28 61

Environmental Problems Stressed

Social -78%
Economic -67
Biological -89
Chemical -44
Physical -83
Geographical -78
Political - 67
Other - 0

Man/Environment Focus:

Totally - 17
Partially - 72
None - 11

Pedagogy

Lecture/Text - 83%
Inquiry/Problem Solving - 94
Additional Insights - 22
Evaluation of Alternatives - 72
CAI - 0
Simulations/Games - 50
Camping - 11
Outdoor Activity - 83

Outdoor Orientation

Field Trips: Urban 33 Industry 33 Rural 44 Wilderness 11
Problem Location: Urban 33 Industry 33 Rural 44 Wilderness 11
Sites: Nature Trail 0 Nature Center 11 Outdoor Lab 50 Other 6
Mobile Units 0 Camping 11 Boats 6

Career Orientation

Yes (Career Education) 11 Yes (Education for Careers) 0 No 89

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[1] Because of overlapping goals or objectives, percentages do not necessarily add up to 100%.

As in the other types, most of the programs could be utilized by any school as they stand, or with modification, and implementation problems were not found to be a major consideration.

Commercial Programs

This includes books and materials produced by commercial publishing firms. This type may be further divided into the following subtypes:

1. K-12: Those books which are specifically aimed at and oriented towards students, K-12, both texts and nontexts.

2. College: Volumes which are specifically aimed at college students and are intended for use as college texts.

3. General Readership: This encompasses those books which are written for an audience including adults, but are not at such a level as to prevent being used by secondary-aged students nor be used as supplemental texts.

4. Advanced Readership: These books are either too advanced in specific and/or theoretical knowledge for students on the secondary level to use or require a strong prior knowledge in the subject matter being discussed.

Miscellaneous Programs

Miscellaneous programs do not fit into one of the five types discussed in this report (Table 4.6). More than one-third of these received federal funds, while the rest were supported from several sources. Nearly ninety percent were developed since 1970. The nature of the programs are well-represented by teachers'guide descriptions which characterize this type.

The largest number of this type address themselves to K-12 programs, including materials and directions to teachers. About one-quarter are directed to secondary age children. A large number are devoted in all or part to

TABLE 4.6

SUMMARY CHARACTERISTICS OF ENVIRONMENTAL EDUCATION PROGRAMS (PERCENTAGE RESPONSE[1]): MISCELLANEOUS

Size of Sample = 25

Dates Operation Began
Pre-1965 - 4%
1965 - 1969 - 8
1970 - Now - 88

Teachers' Guide - 48%

Disciplinary Affiliation
Interdisciplinary - 4%
Multidisciplinary - 28
Conservation - 16
Ecology - 32
Other - 12

Skill Development (Techniques)
Technical, Lab, Outdoor - 48%
Communicative - 24
Human Relations - 44
Camping - 24
Problem Solving - 60

Objectives
Informational - 60%
Camping/Recreation - 64
Skills - 52
Behavior/Value/Attitudinal Change - 60
Teacher Awareness - 0

Transferability of Program
Yes - 52%
Yes, But Must Adapt - 40
No - 8

Target Population
Elementary - 20%
Secondary - 28
K-12 - 40
Teachers - 68
Community Groups - 44
Special - 0

Extent of Program/Problem Focus
World - 0% 8%
National - 12 28
Regional - 8 44
State - 36 48
Local - 32 56

Environmental Problems Stressed
Social - 48%
Economic - 24
Biological - 60
Chemical - 56
Physical - 52
Geographical - 52
Political - 20
Other - 0

Man/Environment Focus:
Totally - 0%
Partially - 64
None - 36

Pedagogy
Lecture/Text - 36%
Inquiry/Problem Solving - 64
Additional Insights - 16
Evaluation of Alternatives - 44
CAI - 0%
Simulations/Games - 28
Camping - 24
Outdoor Activity - 52

Outdoor Orientation
Field Trips: Urban 0 Industry 0 Rural 0 Wilderness 0
Problem Location: Urban 0 Industry 0 Rural 0 Wilderness 0
Sites: Nature Trail 8 Nature Center 24 Outdoor Lab 16 Other 0
Mobile Units 0 **Camping** 8

Career Orientation
Yes (Career Education) 4 Yes (Education for Careers) 0 No 96

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[1] Because of overlapping goals or objectives, percentages do not necessarily add up to 100%.

community groups. With respect to focus, a few deal with global, national, or regional environments, and some are state-oriented. This type is distinctive in that no programs dealt exclusively with local issues.

The miscellaneous type does not have distinctive characteristics with respect to content and methodology. A few are interdisciplinary or multidisciplinary, but most are single-discipline oriented. The programs are heavily oriented towards the natural and physical aspects of the environment and generally there are no distinctive skills or pedagogies identified.

Summary

Six types of environmental education programs have been assessed in this section. Each has been assessed using the TEEP form as a guide. The summary of the six TEEP sections is provided in Table 4.7 and suggests the following generalized conclusions:

1. Many programs are centered around the creation and dissemination of teacher guides.
2. The target population is equally distributed among the elementary, secondary, and K-12 levels.
3. The focus of programs tends to be local in nature.
4. Individual disciplines, e.g., biology, chemistry, geography, etc., tend to be most prevalent.
5. Man/land integration was not found to be fully accepted in most programs that indicate this theme.
6. Outdoor activities were present in many of the programs reviewed.
7. Values, attitudes, and behavior modification was a stated objective in many of the programs.

TABLE 4.7

SUMMARY CHARACTERISTICS OF ENVIRONMENTAL EDUCATION PROGRAMS (PERCENTAGE RESPONSE[1]): TOTAL COMPOSITE

Size of Sample = 146

Dates Operation Began

Pre-1965 - 2%
1965 - 1969 - 6
1970 - Now - 92

Teachers' Guide - 78%

Disciplinary Affiliation

Interdisciplinary - 27%
Multidisciplinary - 42
Conservation - 9
Ecology - 21
Other - 10

Skill Development (Techniques)

Technical, Lab, Outdoor - 70%
Communicative - 32
Human Relations - 43
Camping - 24
Problem Solving - 77

Objectives

Informational - 93%
Camping/Recreation - 30
Skills - 77
Behavior/Value/Attitudinal Change - 77
Teacher Awareness - 0

Transferability of Program

Yes - 47%
Yes, But Must Adapt - 49
No - 4

Target Population

Elementary - 26%
Secondary - 32
K-12 - 47
Teachers - 0
Community Groups - 0
Special - 4

Extent of Program/Problem Focus

World - 0% 8%
National - 3 21
Regional - 5 36
State - 35 46
Local - 58 77

Environmental Problems Stressed

Social - 62%
Economic - 33
Biological - 79
Chemical - 23
Physical - 71
Geographical - 53
Political - 36
Other - 0

Man/Environment Focus:

Totally -20%
Partially -67
None -12

Pedagogy

Lecture/Text - 55%
Inquiry/Problem Solving - 77
Additional Insights - 23
Evaluation of Alternatives - 50
CAI - 0
Simulations/Games - 29
Camping - 23
Outdoor Activity - 72

Outdoor Orientation

Field Trips: Urban 26 Industry 19 Rural 39 Wilderness 6
Problem Location: Urban 22 Industry 21 Rural 34 Wilderness 5
Sites: Nature Trail 12 Nature Center 18 Outdoor Lab 30 Other
Mobile Units 1 Camping 12

Career Orientation

Yes (Career Education) 8 Yes (Education for Careers) 1 No 91

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[1] Because of overlapping goals or objectives, percentages do not necessarily add up to 100%.

8. Transferability was not a major problem.

9. Career education was absent from most of the programs reviewed.

10. Integrating core themes, such as those described in Chapter 3, are absent in practically all cases; although integrative subthemes such as pollution, resource use, land use, energy, population, and especially ecology, were alluded to by most respondents.

Nation-wide Programs: Federally Funded Curriculum Projects

The federal government has sponsored several major curriculum projects that have environmental implications. These projects have usually been financed by either the U.S. Office of Education or the National Science Foundation. Many federally financed pilot or experimental programs have been developed into commercial curricula published by major publishers.

The projects and programs referred to here were all national in scope--not only because of their financial support, but also because they employed people from across the country, were commonly sanctioned by a national learned society (this applies primarily to the secondary projects), and were specifically not affiliated with state, local or regional educational agencies. The projects were usually based at major universities.

These projects represented a sharp break with tradition because the leadership came from professional scientists in the universities rather than from professional educators, and financial support came from foundations and federal grants rather than from the usual state and local agencies. These programs are important because they represent a significant commitment of federal or foundation resources and because many of these projects, after considerable revision, have been published by major commercial publishers.

These projects and the resulting programs are significant because they represent a radical curricular approach, but their impact is limited because they reach less than 20 percent of the total school enrollment.

Elementary Projects are asserted to be interdisciplinary, and indeed some are interdisciplinary, but the more common pattern is a multidisciplinary approach which separate units focus on specific academic disciplines.

The elementary projects can be divided into those that stress cognitive content, that is, rather traditional subject matter, and those stressing cognitive process and skills. At the elementary level the projects tend to stress the scientific method, cognitive skills, scientific attitudes, and conceptual schemes, whereas the secondary projects primarily treat specific disciplines and are subject-matter centered. These projects make grandiose claims to emphasize problem solving, but most of the problems are rather sterile academic problems rather than real-world examples.

The third type of elementary project is the type that attempts to arouse curiosity and excitement about sciences, rather than stressing a single discrete discipline or cognitive process.

The dominant characteristic of the secondary projects, taken together, is that they are discipline-centered rather than student- or society-centered. Stated differently, their emphasis is to update and reorganize the basic academic disciplines in the pre-collegiate curriculum. The earlier projects (1955-1960) were didactic in method and were more concerned with content than teaching style.

After 1960, the projects became more inquiry-oriented, based on the precepts of Jerome Bruner's, The Process of Education. The inquiry projects treated the student as an active participant who should be provided with materials permitting him to discover for himself underlying patterns of relationships. Many of these inquiry-oriented projects have been published commercially.

The secondary projects varied somewhat in their approach to the academic disciplines, but since most were developed under the auspices of professional organizations representing specific disciplines, they focused primarily on discrete scientific disciplines as their titles suggest. The projects stressed the concerns of the scientist and the theoretician rather than the concerns of citizens.

Science curriculum projects deal with environmental education only insofar as some aspect of environment represents a major facet of the involved discipline or disciplines. Most programs of this type were developed before the concept of environmental education received national credence. Thus, environmental units and activities appear most frequently in specific units of the programs. In many cases these represent genuine attempts at either multidisciplinary or interdisciplinary approaches to environment, although the emphasis tends to remain in the natural sciences.

The programs were designed to be highly transferable and they are indeed transferable because they are nearly all self-contained. A more serious problem than transferability is the cost of implementation. Most programs are extremely expensive at the beginning because they include books, kits, apparatus, and expendable booklets, posters, sheets, etc. Also, the units are usually bulky and present storage problems.

Many projects are not conducive to being implemented piecemeal by units. Teachers commonly want to employ sections of the projects, but do not want to use the entire program; this is prohibitively expensive and discouraged by the developers and the commercial publishers. Most projects are highly sequenced with the later units based on content and skills taught in earlier units. A similar problem is posed by the transfer student who lacks a background in the specific project; it is difficult to enter the curricular projects after the beginning units.

Virtually no emphasis is made on career education per se in these projects, although the students are exposed directly to a wide variety of occupations and professions.

Environment-Based Education in Higher Education

The term "higher education" refers to all post-secondary educational institutions including community and junior colleges, colleges and universities, and graduate schools. Consideration has also been given to environmentally-based education associated with specialized research institutes of various types.

Data was obtained from several sources. First, a thorough review was made of current college catalogues. All courses and programs which contained the word "environment" were identified and examined as to contents and requirements. Following the same procedure, those courses and programs which were clearly within the scope of environmental education as defined earlier, were also inventoried and examined; information on such programs as conservation, nature study, and outdoor education was obtained in this manner. In addition to the catalog search, an effort was made to contact directly the supervisors of large-scale and/or particularly well-known programs. These were identified either through the catalog search method, or from a search of the literature on environmental education.

This report on the place of environmental education in higher education is divided into two sections. The first deals primarily with an analysis of environmental education in higher education by the types of programs and their associated organizational structure. The second section presents an overview of environmental education according to institutional class (e.g., community colleges, four-year colleges and universities).

Types of Environmental Education Programs

From the organizational standpoint, five substantially different approaches to environmental education may be identified. These are: the General Awareness Course; the Traditional Discipline-Based Program; the "Potpourri" Approach; the Integrated Approach; and the Research Institute.

The General Awareness Course. Products of the late sixties and early seventies courses such as "Man and Environment," "Man's Environment," "Ecology and Man" and others with similar titles were developed to serve undergraduate general education objectives and to provide students with a sense of awareness about man's relationship to his environment (Table 4.8). These courses are found in the offerings of nearly all institutions of higher education. They are variable in format and content, but in general, feature a broad-brush general description of environmental processes and man-environment problems. They are not oriented to development of skills, nor do they feature an outdoor orientation.

Such courses are usually designed to serve large numbers of students (in some institutions as many as several hundred each semester). In most cases, they are designed to serve underclassmen in community colleges, colleges, and universities, or in cases where such a course is offered at the upperclass or even the graduate level.

With respect to their relationship to traditional disciplines, general awareness courses are of two general types. At many institutions, they have been developed largely within the administrative and intellectual boundaries of a single discipline, often geography or biology. At other institutions, the course is developed and taught by members of several disciplines; biology, geography, geology, economics, earth science, political science, engineering,

TABLE 4.8

REPRESENTATIVE TITLES OF GENERAL AWARENESS COURSES

Ecological Problems and Society (Brooklyn College)

Environmental Science (Emory University)

Environmental Studies (University of Maine)

Environmental Earth Studies (CCNY)

Man and His Environment (New Mexico Highlands University)

Man and Environment; Community Environmental Problems; Life Styles and the Environment; (Three courses, University of Nevada)

Introduction to Environmental Science (Seminole Junior College, Seminole, Oklahoma)

The Environment and Man (University of Arkansas)

Introduction to Environmental Studies (University of Washington)

Man and His Environment (Boise State University)

Man in the Biosphere (University of Wisconsin at Oshkosh)

Environmental Studies (University of Nebraska) and architecture; these are among the fields which are commonly joined in such a venture.

These courses do not purport to be concerned with developing student skills or techniques; rather, they tend to focus upon the cognitive and conceptual aspects of the subject.

The general awareness courses are taught using many different teaching-learning strategies, including self-teaching modules, individually paced instruction, lectures, and lecture-discussion approaches. However, environmental education programs do not seem to be particularly distinguishable by their pedagogy or their innovativeness or quality, unless this distinction is related to the extent to which team-teaching is common to such programs.

There seem to be no serious barriers to transferring such programs from one institution to another. A minor problem may be related to the administrative barriers to the cross-disciplinary courses, and the possibly high costs of general environmental awareness courses relative to other service courses, especially when team-teaching is employed.

It seems to be a fair generalization that the career orientation of such courses is no more or no less than that of other survey or general awareness courses.

The Traditional Discipline-Based Program. In American higher education, the traditional discipline continues to provide a home for a large proportion of all environmental education. Many important environmental education programs are developed within the administrative confines, and to a large extent upon the existing course offerings, of a traditional discipline. Such programs can often be identified by their title in which "environmental" serves to modify the traditional degree, subject or major -- environmental law, environmental geology, environmental biology. (Table 4.9) In other instances,

TABLE 4.9

TRADITIONAL DISCIPLINE-BASED ENVIRONMENTAL EDUCATION PROGRAMS: SAMPLE REQUIREMENTS*

Environmental Biology

Required Courses in Biology
- General Biology
- Cellular and Molecular Biology
- Genetics
- One of the Following:
  - Plant Physiology
  - Animal Physiology
  - Cell Physiology
- Ecology
- Four of the Following:
  - Advanced Ecology
  - Population Biology
  - Environmental Biology
  - Limnology
  - Microbiology
  - Biogeography

Recommended Courses in Other Areas (3 required)
- Conservation of Natural Resources
- Environmental Health
- Anthropology
- Population Geography
- Public Administration
- Computer Programming
- Economics of Environmental Issues

Required Courses in Other Areas
- Chemistry
- Calculus
- Statistics

Environmental Psychology

Required Courses in Psychology
- General Psychology
- General Experimental Psychology

- Two of the Following:
  - Perception
  - Learning and Motivation
  - Physiological Psychology

- Three of the Following:
  - Social Psychology
  - Developmental Psychology
  - Abnormal Psychology
  - Environmental Psychology
  - Field Work in Environmental Psychology

Required Courses in Other Fields
- General Biology
- Environmental Biology or Genetics or Ecology
- Calculus
- Statistics
- Introduction to Environmental Engineering
- Principles of Economics

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*Do not include "general education" requirements.

a similar program may go under the guise of a subdisciplinary "track" or "option" within the major field, but does not carry a separate degree designation. Such programs are found in higher education institutions at all levels of the educational hierarchy, and in all types of institutions. It is not known what the extent of student enrollments is in these programs.

Traditional discipline-based environmental education programs have been developed and administered, and to a large degree are taught, within a single discipline. In many cases, these programs do require course work in complementary fields, but such cross-disciplinary cooperation tends to be limited to a relatively small proportion of total course work. On the other hand, it does not follow that such programs are completely lacking in an integrative approach to interpreting and solving environmental problems. Rather it appears that at least some of these programs, by judicious selection of student's cognate work, by drawing upon the interdisciplinary experience, training, or instincts of some faculty, and by relying upon the considerable breadth of faculty backgrounds within a single discipline, are able to accomplish a degree of integration of disparate viewpoints, approaches, and subject matter which is uncommon in all but the most elaborate and well designed cross-disciplinary types of programs.

Traditional discipline-based environmental education programs emphasize skills and techniques to the same extent that the host discipline itself does. There is no consistent pattern with respect to whether or not specialized techniques courses are developed or required in such a program. In a few instances, special "applications" courses have been developed, presumably to allow for the application or modification of skills learned elsewhere to environmental problems. Independent or group research projects specifically oriented to the environment serve as capstone courses, particularly in the graduate level versions of such programs.

The teaching techniques in general, and the extent of outdoor learning activities in particular, mirror the orientation of the major discipline with which this type of environmental education program is associated. In environmental biology, environmental geology and the environmental options associated with geography, field skills are emphasized. Programs associated with outdoor education and physical education and recreation also maintain the outdoor traditions closely identified with those subjects. Environmental engineering and environmental health, have some orientation to the outdoors while on the other hand, environmental law, and environmental administration usually do not.

Transferability and the development of such programs appears to be easily accomplished. Indeed this particular type of program enjoys popularity in part because administration barriers to other cross-disciplinary programs are considerable, while it is relatively easy to develop a program within an existing disciplinary framework. Thus, regional specificity is uncommon and does not appear to be a limiting factor to program development, nor do costs, since such programs typically rely upon existing staff, space, and equipment.

It appears that one of the strongly motivating forces for such programs is the desire of disciplines to improve and expand employment prospects for their students. This is a logical outgrowth from the current high tide of concern over environmental problems. At the same time, however, the content of the courses themselves do not necessarily reflect a strong career orientation.

The Potpourri Approach. A common method of creating an environmental studies program is to bring together a group of faculty representatives from several, or many disciplines to plan the new program, "because the solution to today's environmental crisis requires the perspectives of many disciplines, not just one, or two." After considerable discussion it develops that each of these faculty members feel that he or she represents a discipline which is already making a (the!) major contribution to understanding and solving man-environmental processes and problems. Moreover, the group quickly comes upon some very real administrative problems associated with developing new courses and new curricula. These problems include the general resistance to creating new courses and degrees, the need for additional staff or reshuffling of present staffs, and specter of undercutting course enrollments in existing programs.

As a result, what often emerges is a compromise where a so-called "environmental studies" major or minor program is based largely, or even entirely, upon existing course offerings. A student's curriculum is developed from a list of existing, acceptable courses in various disciplines. The resulting program might appropriately be referred to as the "potpourri" approach to environmental education.

These programs are properly regarded as multi-disciplinary. It is not possible to generalize about what specific subject areas are included, and which are emphasized (it seems likely that the emphasis depends to a large extent upon the disciplinary representation of the program planning committee, as much as anything). However, nearly all potpourri environmental education programs make some effort to include courses from biological, earth, and social sciences. Many also include engineering sciences, humanities, architecture, physical and mathematical sciences.

If a core environmental science course or two is required, they are quite commonly survey courses, frequently of the general awareness type. More rarely there will be an interdisciplinary "capstone" type course, requiring synthesis and evaluation of previously acquired knowledge. In any case, it seems fair to say that inter-disciplinary orientation of the program rests either with such core courses or, in the cases in which student participants draw heavily from one discipline, to the extent to which that discipline is able or willing to assist in the integrating effort.

Content in such programs is varied. (Table 4.10) Depth may be superficial because of the tendency to take introductory courses in several areas. This particular feature of the potpourri approach appears to make it relatively more popular in liberal arts colleges where the overall educational objectives are often consistent with this broad-brush environmental education type of program. For the same reasons this program type does not emphasize skill or technique development unless the environmental education program is simply an add-on minor to a major in a traditional discipline or a second major, in which case the skills which are developed are those of the more traditional department.

The major advantage of the potpourri type of program is that it is easily developed, and as noted earlier, this is probably one reason it is so common. It avoids most administrative barriers to curriculum redesign. Even with a small, separate, environmental studies core, it is not very expensive. It draws upon existing courses, faculty, equipment, and space.

With respect to its career orientation, the potpourri program tends to be quite variable. It is, for example, the type of program which serves as the model for most community college "environmental technology" programs, in which the orientation to career planning and vocational training is extreme. On the other hand, it is also this type of program which serves as a basis for the structure for many liberal education programs, quite lacking in vocational-training or career-oriented content.

TABLE 4.10

THE POTPOURRI APPROACH: A SAMPLE PROGRAM*

Required Courses:

- Introduction to Environmental Studies
- Advanced Environmental Studies

Electives: Students must take three courses from each of the following groups:

- Natural Sciences
  - Plant or Animal Physiology
  - Ecology
  - Limnology
  - Biogeography
  - Population Biology
- Social Sciences
  - Conservation of Natural Resources (geography)
  - The Economics of Environmental Decisions
  - Decision-making in Resources Management
  - Human Ecology
  - Land Resource Economics (Agriculture Economics)
  - History of Resource Policy
- Physical Sciences
  - Structural Geology
  - Physics of Energy
  - Geomorphology
  - Meteorology
  - Climatology
  - Chemistry of the Atmosphere

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*Does not include "General Education" or prerequisite course requirements.

The Integrated Approach. As a result of growing interest in the interface between man and the environment, some institutions have made a strong commitment to curricula reorganization and development. This has led to the creation of quite uncommon cross-disciplinary programs which are highly structured, and, as a class, more integrative than most environmental education programs. Such programs contain a required core of several courses, and in some instances may include a whole curriculum of courses which are not identifiable with traditional disciplines. In nearly all cases, such programs have a separate administrative home with a separate budget, faculty, and course offerings (Table 4.11).

A common characteristic of these programs is the housing of representatives of several disciplines under one administrative roof, with names such as environmental education, environmental sciences, environmental management, and so on. The department develops and offers sequential or programmatic core of courses which is designed to achieve both an understanding and integration of the various points of view, the approaches, and the expertise of the various contributing faculty members in the program.

Traditional disciplinary distinctions are deemphasized, both in terms of the course titles and problem focus. While the core courses are the heart of the program, students may be required to take courses outside of the environmental studies department depending upon their particular interests within environmental studies. Careful attention is given to the appropriateness of this cognate work. Quite often students can choose from only a narrow range of prescribed cognate courses. In other cases, more freedom in cognate work selection is given, but closely supervised in order to insure that such choices are consistent with the overall objectives of the program.

TABLE 4.11

THE INTEGRATED APPROACH: SOME REPRESENTATIVE PROGRAMS

Bachelor of Arts in Human Ecology, College of the Atlantic

Environmental Education, The University of Michigan

Environmental Control and Ecosystems Analysis, University of Wisconsin, Green Bay

Human Ecology, Environmental Planning, Environmental Education, Environmental Education, Environmental Administration, etc., Huxley College, Western Washington State College

Social Management of Technology, University of Washington

Environmental Studies, California State University at Sanoma

Environmental Studies, Rollins College

Environmental Science, University of Virginia

Environmental Systems Management, American University

While the man-environment focus and the integrative character of the program are features which are invariant, the specific content does vary considerably. Two conditions appear to be factors in influencing program content. Obviously the backgrounds of the various faculty play a role in setting the overall boundaries of the content, but the extent and nature of the career orientation of the program is also important. For example, some programs emphasize the environmental systems analysis while in others the environmental systems management is the main thrust; still others emphasize environmental systems, education, teaching, and communications. Some programs have several internal tracks, depending upon a student's aspirations with respect to a career.

Integrative type programs feature skill development within the framework of the particular program's orientation to the man-environment interface. Thus, there are some rather innovative skills courses which emerge. On the other hand, most of the programs also encourage development of traditional techniques and skills either within the limits of the departments' own resources or in the context of the cognate requirements.

Because of the tendencies toward innovation with respect to administrative organization, curriculum organization, and content, integrative programs seem to have a greater appreciation, and utilization of, innovative and unusual teaching approaches. That is not to say that "tried and true" methods are not employed, or that other types of environmental programs are lacking in innovation; rather, the relative frequency of such approaches is greater in this type of program; (self-pacing, self-teaching, modular curricular design). There is also emphasis on independent study projects, and internships, in most institutions having integrative programs.

Nearly all of the examples of the integrative type of program have a considerable outdoor orientation - field courses, independent research courses, internships, and other "hands-on" ingredients are characteristic. "Learning by doing" and its corrollary, "learning about the environment in the environment" seem to be guiding principles of the integrative type of program.

The integrative program is not readily transferable. To develop such a program in an institution, it must make a major commitment to administrative reorganization, easier talked about than accomplished, given powerful disciplinary interests in maintaining the *status quo*. Moreover, such programs are costly, for they require a separate staff, equipment, and space.

Students may also be reluctant to participate in such a venture, for they suspect that employers may not be as familiar with the environmental science major and with the course tities in this program as they are with more traditional programs and their contents.

Most of these programs try overcoming this student hesitation by stressing the career orientation of such programs.

The Environmental Research Institute. There are quite a large number of environmentally-oriented research organizations. They exist to draw together researchers from various environmentally-oriented fields, and are dependent upon research grants and contracts. (Table 4.12) Frequently they have an educational function, but it is secondary to the research effort, and is usually limited to supervising student research assistants and research projects by graduate students. Examples of such organizations include Environmental Institutes, Environmental Research Institutes, Environmental Research Center, The Center of Environment and Man, Institute of Ecology, Center for Environment and Urban Problems, Center for Urban Research and Environmental Studies.

TABLE 4.12

SOME ENVIRONMENTAL INSTITUTES AND THEIR DECLARED FUNCTIONS

Institute	To Provide Council and Guidance to Government, Industry, and Education	To Coordinate Research Oriented Toward Solutions of Problems	To Involve Students
Institute for Environmental Studies - University of Washington, Seattle		X	X
Environmental Resources Center - Georgia Tech, Atlanta		X	X
Environmental Resources Center - Colorado State University, Ft. Collins	X	X	X
Center for Environmental and Urban Problems - Florida International University and Florida Atlantic University, Ft. Lauderdale	X	X	
Center for Urban Research and Environmental Studies - Seton Hall University, South Orange, New Jersey	X	X	X
Environmental Center - University of Hawaii, Manoa	X	X	X
New Mexico Environmental Institute - New Mexico State University, Las Cruces	X	X	
The Institute for Environmental Education - Cleveland, Ohio			X
The Center for the Environment and Man, Inc. - University of Connecticut, Hartford	X	X	
Institute of Ecology - The University of Georgia, Athens		X	
Technology Application Center - University of New Mexico, Albuquerque	X		
The Center for Environmental Studies - Virginia Polytechnic Institute and State University (Virginia Tech), Blacksburg	X	X	X
The Institute of Arctic Environmental Engineering - University of Alaska, Fairbanks		X	X
The Institute of Arctic Biology - University of Alaska, Fairbanks		X	X
Arctic Environmental Information and Data Center - University of Alaska, Anchorage	X	X	

Oceanographic, arctic, tropical, and water resources centers are more specialized variations on the same general theme.

Ordinarily, research institutes are associated with the larger universities, otherwise they have no clear locational pattern. Some of the more specialized programs are less closely associated with universities; these tend to be found in a location which is appropriate to the subject in which they specialize.

In nearly all cases the research institutes involve several or more disciplines. To the extent that they provide an educational function, that function reflects the cross-disciplinary character of the primary or research mission of the institute. The disciplines that are involved roughly reflect the availability of research funds, so that physical, engineering, and natural sciences are rather well represented, the social and behavioral sciences are to a lesser extent, and it is uncommon to find humanities involved at all.

Whatever the environmental research emphasis of such programs, their education values are closely identified with developing and applying research skills. It is common for the student to be supervised by a team of specialists from various disciplines, and in some instances the student may even conduct the research with members of other disciplines. However, the general teaching strategy appears to be that of independent study.

The development of this type of environmental education program is limited to centers with access to large numbers of researchers from many disciplines and with access to sophisticated and costly research equipment. There is no explicit career orientation to such programs, though learning to be an environmental research scientist may be implicit. Perhaps the greatest significance of the research institute has to do with bringing together representatives from many disciplines, thereby the research institute serves as a stimulus to development of more broadly based environmental education programs. In some instances, the environmental research and teaching efforts are administratively combined in an Environmental Institute, or environmental studies council.

Summary. Five types of environmental education programs have been described in this section. Each has been assessed in terms of seven criteria. This five-by-seven matrix is summarized in Table 4.13. Additionally, it should be noted that core theme development (Chapter 3) is often used in the integrated approach. With the exception that themes may sometimes be applied in the Potpourri and Research Institute approaches, they are generally absent from the other programs. Specific examples of colleges and universities using core themes and the integrated approach are provided in Chapter 6.

Environmental Education by Types of Higher Education

Environmental Education in the Two-Year College.

Most of the over eleven hundred two-year colleges offer some sort of man-environment education. The programs tend to fall into two categories; General Environmental Education courses and programs, and Environmental Technology programs. Probably half of all junior and community colleges offer at least one such curriculum leading to a certificate or an associate of arts degree in some field associated with environmental education.

Since general education is a common goal of community and junior colleges, the "general awareness" type course in environmental education is frequently offered. For example, an innovative course entitled "Man and Environment" has been cooperatively developed by a group of community colleges and is widely used throughout the United States. Such general awareness courses appear to be integrative of the approaches and substance of many different disciplines such as geography, economics, anthropology, biology, and sociology to name but a few. At times, representatives from several such disciplines may participate in a "turn taught" course, thus offering exposure to several viewpoints on man's relationship to environment. More

TABLE 4.13

SUMMARY OF TYPES OF ENVIRONMENTAL EDUCATION PROGRAMS

Types of Environmental Education Programs	Distinguishing Features of Program	Relationship to Disciplines	Extent of Integration of Man-Environment	Predominant Target (Level and Institutional Type)	Outdoor Orientation	Career Orientation	Other
GENERAL AWARENESS COURSE	Single course survey, introductory level	2 versions: single disc., mult. disc.	variable from much to little	underclassmen-all institutions	little or none	none	
THE TRADITIONAL DISCIPLINE-BASED PROGRAM	Combined with, (or carved out) of traditional disciplines	discipline based, some with cognates requirement in other disciplines	variable from much to little	undergrads and grads, all institutions	variable, depends upon disciplinary affiliation	yes	
THE "POTPOURRI"	(major or minor) program developed list of traditional courses; may have nominal core	multi-disciplinary	usually little	undergrads - all institutions but especially common in community college and liberal arts college	variable, depends upon disciplinary affiliation		variable - may or may not be highly structured as to requirements
THE INTEGRATED APPROACH	major or minor, program with heavy reliance (upon core program)	inter-disciplinary	usually much	undergrad and grad, mostly liberal arts and smaller universities	usually major emphasis	usually	sometimes the model for a whole college curriculum
THE RESEARCH INSTITUTE	Independent or group research	multi and inter disciplinary	variable from much to little	graduate students major universities	variable, depends upon specifics of project	yes	

frequently, however, the general awareness course is taught by a representative of but a single discipline, commonly a biological scientist.

Some general education degree programs offered by community and junior colleges require the student to take a "core" of environmentally related courses from several disciplinary fields. The student rounds out such a program by electing a number of additional courses from the behavioral and natural sciences, and to a lesser extent from the engineering and physical sciences. While there is a strong multi-disciplinary orientation to such programs, the responsibility for integrating the materials taught by the several disciplines is usually left with the student, and may or may not take place.

The most distinctive contribution of the community and junior college to environmental education lies with the occupationally-oriented degree program. Commonly, such programs are closely associated with the engineering sciences, and are designed to bring together disparate disciplines in a highly "applied" program. These programs are often collectively referred to as "environmental Technology programs" and have titles such as environmental health technology, air pollution technology, waste disposal technology, urban planning technology, waste pollution control, and water quality technician.

Community and junior colleges offer considerable amounts of environmental-based education, especially of the career oriented environmental technology sort. Four clusters of environmentally oriented jobs are closely associated with community college programs: pollution prevention and control, disease prevention (non-patient care), environmental planning, and resource control. As much as two-thirds of the work of a student seeking a job in one of these areas will be indirectly related course work. A major barrier with respect to implementing technical training of this sort is the cost of providing equipment upon which proper training depends. In addition, because some environmental education programs are "tailor made" to meet a specific employer or governmental agency's specifications, these programs are difficult to transfer to another setting.

Environmental Education in Four Year College and University Undergraduate Programs. Like their colleagues in the junior and community colleges, undergraduates at four year colleges and universities are offered a great variety and number of environmental education programs. In addition to general awareness courses of the variety previously described, students may select among the traditional disciplines dealing with some aspect of the environment, cross-disciplinary courses and majors, and many combinations of these and other approaches to improving knowledge and skills relating to the environment. The following sample of course and program titl is suggestive of the wide ranging character of environmental education offered at four year colleges and universities:

(1) Resources and Man
(2) Man and Environment
(3) Environmental Psychology
(4) Natural Resource and Ecosystem Analysis
(5) Transdisciplinary Program in Environmental Studies
(6) Environmental Resource Management
(7) Environmental Education
(8) Environmental Science
(9) Conservation of Natural Resources

It is difficult to find a single example of an institution offering the bachelor's degree that does not now offer some sort of program in environmental education.

There are several approaches to the organization of environmental education programs at four year institutions. Commonly, for example, an underclassman "general awareness" survey course may be "turn taught" by a staff drawn from several disciplines. Such a multi-disciplinary course is a relatively popular feature of many undergraduate environmental education programs. In most instances each member of the team takes his turn at presenting his disciplines perspective on environmental problems, their dimensions, causes, and possible solutions.

Less frequently, the same general environmental awareness course may be truely "team taught" by a team consisting of the representatives of a few disciplines such as biology, geography, geology, or anthropology. The team interacts throughout the duration of the course in planning, presentation, discussion, and evaluation. Such an approach has the obvious advantage of offering better integration of ideas through personal interaction and the play of conflicting viewpoints.

Several types of environmentally-oriented degree programs are found in undergraduate curricula. Many traditional disciplinary majors place heavy emphasis on the environment encluding majors such as wildlife management, forestry, geography, biology, among others. Another approach involves the creation of a sub-disciplinary specialty featuring a series of courses within a single discipline plus a relatively small amount of cognate work in other disciplines. Environmental psychology, environmental engineering, environmental geology, environmental architecture, and environmental geography programs are examples of this approach. Closely associated with such sub-disciplinary programs are those in which a student earns a major in one of a large number of traditional fields, and supplements this training with a "minor" or certificate in Environmental Studies. Coursework in such a program consists either of a block of specified, and perhaps highly integrated, environmental studies courses, or of selections from a master list of existing traditional courses, which deal specifically with the environment (biology, geology, chemistry, physics, etc.) or have some significance to man's understanding of the environmental problems (political science, geography, recreation or physical education, engineering, and more rarely philosophy or ethics).

Of growing importance to the undergraduate programs in environmental education are environmental studies majors. These appear to follow two patterns.

The first is developed primarily around existing environment-oriented or environmentally significant courses, and the type may be more or less flexible in terms of the range of disciplines involved and the extent to which the student selections are prescribed. The second pattern is characterized by a separate environmental studies core curriculum, consisting of at least some specially-developed courses dealing with man and the environment. Usually these specially-developed courses do not correspond well with traditional courses in terms of content or approach; they are frequently integrated, interdisciplinary efforts, and are often team-taught.

Most of the environmental education programs at four year institutions depend upon the traditional disciplines for manipulative skill and technique development. The extent of emphasis on manipulative skill development depends upon the emphasis placed on it in the environmental studies program.

With the exception of team and turn-teaching approaches, there do not seem to be any teaching strategies uniquely identified with undergraduate programs in environmental education at four year colleges and universities. That is not to say that teaching-learning strategies and techniques are not sound or innovative but rather that they are sound and innovative to about the same degree as in other undergraduate programs.

Outdoor education is closely identified with most undergraduate environmental education programs. In many cases, however, this emphasis on field trips, field work, field camps, and independent field projects the structure and the amount of attention given such activities in the traditional disciplines which comprise the environmental education program.

Most environmental education programs developed for undergraduates appear to be capable of being easily transferable. Little in the way of special equipment, beyond that which is normally available in environment-oriented departments is required. Nor does there seem to be much in the way of program orientation toward specific locations. Some programs do take advantage of proximity to special environmental situations such as oceans, wilderness areas, nature preserves, deserts, etc., but this reflects opportunity rather than necessity.

The extent of career orientation of undergraduate environmental education programs reflects the extent of career orientation in undergraduate programs in general. That is to say, the emphasis on career orientation varies considerably with the institution, and the specific program. Teacher training programs in environmental studies are at one extreme, while at the other is the liberal education flavor given environmental education programs in some institutions, particularly some of the smaller ones. The "add-on" programs, on the other hand, are often advertised as programs which, "in this day and age improve the employability" of the students in a traditional major thus stressing a supposed career orientation. In some of the more integrated and structured programs curricular tracks are often developed around specific job themes such as water pollution control, environmental impact assessment, and environmental data storage, retrival, and analysis.

Environmental Education at the Graduate Level. Environmental education is not so common in graduate schools, yet is does exist and in some instances programs are quite significant in terms of enrollments, educational innovation and contributions to society. Programs examined include those entitled environmental studies, environmental science, environmental engineering, bio-environmental engineering, resources management, environmental education, environmental systems management, public management, and environmental pollution control. While most of these programs appear to involve relatively small numbers of students, some have generated as many as several hundred graduates over the years. It is most common for such programs to be oriented towards the master's level though some institutions do offer a course of study leading to the doctoral degree.

The engineering sciences appear to dominate environmental education programs at the graduate level. Empahsis on the biological sciences is also common, while physical, mathematical and computing sciences, and the social sciences, seem to perform mainly auxiliary functions. Other fields, such as journalism, and public administration play important roles in a few specialized programs.

As a whole, graduate level programs tend to emphasize a single traditional discipline and draw on another, or several others, as necessary to accomplish their objective. In one variant of this general pattern, a student "majors" in one field and has an environmental studies "minor" drawn from a "shopping list" of approved courses from one or many other disciplines. A less flexible version of this approach is the case in which the student's major field is supplemented with a specified set of courses designed to provide other disciplinary viewpoints or expertise on a particular environmental problem. This is particularly common in the environmental engineering programs, environmental pollution control, environmental management, and bio-environmental engineering. As a rule, such programs rely fairly heavily upon course offerings which are traditional to the disciplines in which they are taught. The integration of material covered by such courses is left primarily to the student, sometimes but not alsays to be demonstrated in a thesis or dissertation. Advisory committees or research committees are often made up of representatives from two or perhaps more disciplines.

There is a strong career orientation to graduate programs, as might be expected, given the general function of graduate curricula. In this connection is the existence at certain institutions with graduate offerings of "Research Institutes" which are primarily a by-product of contract research work. In terms of environmental education, these institutes serve primarily to enhance the research experience component of graduate work.

Environmental Education in Teacher Training Programs. The future of formal programs in environmental education in elementary and secondary schools is closely tied to the character and quality of teacher training programs. The status of environmental education within the colleges of education, in general, is not easily defined. However, relatively speaking, little is being done with respect to environmental education in the teacher-training programs. It appears that this is in part, tied to the lack of definition that environmental education has in the public school curricula. For example, it has been reported that as recently as 1973 that in only seven of the states could a person be certified to teach environmental education (Trent). Only a handful of states have a full-time coordinator of environmental education.

In only a few colleges or departments of education is it possible to identify a separate curriculum in environmental education. Moreover, in most cases there are no separate environmental education methods courses. It appears that what environmental teaching methodology is available is taught in the context of the so-called science education courses which are strongly natural and physical science oriented. Also common is the environmental education ingredient in the outdoor education curricula which are associated with physical education or recreation programs.

By far the most common pattern is for a person to major in environmental studies but to receive certification in either a general category (such as elementary education, or natural science), or in a specific discipline for which certification is available.

Summary. The second section of this chapter discusses the program organization, content and orientation of environmental education in: (1) community and junior colleges, (2) four-year colleges and university undergraduate programs, and (3) at the graduate level. All three types of higher education institutions offer considerable opportunity for implementing the core themes presented in Chapter 3. To date, actual implementation is almost nonexistent.

Environmental Education in Nonschool- and Outdoor-Based Organizations

Nonschool-based programs refer to the efforts of organizations not involved primarily in formal/institutional education. Within this very large and somewhat loosely defined source of environmental education, four major categories may be designated: Environmental Organizations; Governmental Agencies; Businesses and Industries; and Other. Subsequently, these four were subdivided further into a total of eighteen subcategories (see Table 4.14).

Representation was sought from any and all possible sources of environmental education programs outside of the formal school setting. Organization names and addresses were selected initially from The Conservation Directory. published by National Wildlife Federation, 1974 and 1975. Beyond this single, but comprehensive source, further inquiries were made from a variety of other directories (e.g., on foundations, businesses, associations, government, etc.), plus a host of separate recommendations from helpful organizations and individuals.

The information describing the environmental education programs of the respondents arrived in a variety of forms including published books, kits (of nearly all varieties), mimeographed reports and handouts, films, posters, brochures, simulation games, pamphlets, personal interviews, etc. The data gathered were transferred onto a TEEP Form (See Appendix B) for sorting and eventual classification.

TABLE 4.14 - NONSCHOOL-BASED MAILINGS

	Number of Letters Mailed Out	Number of Organizations Discussed in Final Survey
A. Environmental Organizations	121	(89)
1. Major/National		4
2. Minor/National		15
3. Regional		6
4. State		25
5. Local		15
6. Topical		24
B. Governmental Agencies	102	(72)
1. Federal		23
2. Regional		3
3. State		41
4. Local		3
5. Quasi		2
C. Business and Industry	94	(68)
1. Corporations		47
2. Business Associations		21
D. Others	158	(40)
1. Service Clubs		12
2. Professional and Labor Associations		11
3. Private Foundations		4
4. Commercial Outdoor Education/Recreation		7
5. Miscellaneous		6
TOTAL	475	269 (57%)

The materials received from the eighteen subcategories of organizations and agencies were evaluated on the basis of:

1. Publications/Materials Disseminated.
2. Workshops/Conferences/Seminars Sponsored.
3. Funding Efforts.
4. Other Activities.
5. Subject Matter Orientation.
    a. Natural Science.
    b. Social Science and Natural Science.
    c. Social and Natural Science Including a Citizen Action Phase.
6. Skill Development.
7. Outdoor Education.
8. Pedagogy.
9. Stated Objectives.
10. Target Population.
    a. Age
    b. Location.
11. Transferability and Implementation.
12. Career Orientation.

The great diversity present within and among governmental agencies, business and industry, environmental organizations, private foundations, and others assures that nonschool-based environmental education will include enormous variety vis a vis content, methodology, and objectives. The descriptions, summarized from the TEEP instrument, affirm that a broad range of environmental education functions occurs. The summary provided in Table 4.15 suggests the following generalized conclusions regarding these nonschool and outdoor organizations:

1. Dissemination of environmental education publications and various materials is an important function for most of these organizations.

TABLE 4.15

NONSCHOOL-BASED TABLE OF SUMMARY FUNCTIONS

	Number Sampled	ACTIVITIES				CONTENT ORIENTATION			CONTENT		
		Disseminate Publications/Materials	Conduct Workshops, etc.	Fund EE Directly	Conduct Other EE Activities	Natural Science	Natural & Social Science	Natural & Social & Citizen Action	Skill Developments Taught	Outdoor Education Featured	Career Education Offered
ENVIRONMENTAL ORGANIZATIONS											
Major/National	4	⬤	⬤	•	⬤	⬤	⬤	⬤	•	⬤	•
Minor/National	15	⬤	⬤	•	⬤	◯	⬤	◯	•	⬤	•
Regional	6	⬤	⬤	•	⬤	◯	⬤	◯	◯	◯	•
State	25	⬤	◯	•	⬤	◯	◯	◯	•	◯	•
Local	15	•	⬤	•	⬤	◯	⬤	◯	◯	⬤	•
Topical	24	⬤	◯	◯	⬤	◯	⬤	◯	•	⬤	•
GOVERNMENTAL AGENCIES											
Federal	23	⬤	◯	◯	⬤	◯	◯	○	◯	◯	◯
Regional	3	◯	◯	○	⬤	◯	◯	○	○	◯	◯
State	41	⬤	⬤	◯	⬤	⬤	◯	◯	•	◯	◯
Local	3	•	◯	○	◯	⬤	◯	○	○	⬤	•
Quasi	2	⬤	⬤	○	⬤	⬤	•	○	•	⬤	◯
BUSINESS & INDUSTRY											
Corporations	47	⬤	◯	◯	⬤	⬤	⬤	◯	◯	•	•
Business Associations	21	⬤	•	◯	⬤	⬤	⬤	◯	•	•	•
OTHERS											
Service Clubs	12	⬤	⬤	○	⬤	◯	◯	◯	◯	◯	○
Professional & Labor Assc.	11	⬤	◯	○	⬤	◯	◯	◯	◯	○	◯
Private Foundations	4	○	◯	⬤	○	◯	◯	◯	○	○	○
Commercial Outdoor Ed/Rec.	7	○	◯	○	⬤	⬤	◯	•	⬤	⬤	•
Miscellaneous	6	⬤	◯	◯	⬤	◯	◯	○	◯	○	○

⬤ = A very important function/characteristic of the group.

◯ = A very important function/characteristic for some members within the group.

• = A minor function/characteristic of the group.

○ = Not a function/characteristic of the group.

2. An extremely wide variety of organizations conduct environmental activities.

3. Immense diversity exists within and among the eighteen groupings—as evidenced by the frequency of important functions characteristic of only some members within groups.

4. Committments exist to both the natural sciences and social sciences, but with a stronger emphasis on the former.

5. Citizen action orientation is largely absent from government organizations, but is an important function for some members of the other groups.

6. Direct funding of environmental education (via grants, subsidies, etc. to other organizations) is rare and limited in quantity.

7. Skill developments and career education have low priorities.

8. Outdoor-oriented education is prominent, particularly among governmental and environmental organizations.

The bulk of the sampled nonschool-based organizations that have environmental education programs place emphasis on general environmental awareness; this is implemented mostly through the development and distribution of a wide variety of informational sources. Indeed, only rarely do individual efforts deal with more than a small part of the total environmental picture (especially as defined by the Environmental Education Act of 1970). The survey indicates that a very large portion of all current environmental education activities are limited principally to the dissemination of materials in the form of booklets, handouts, brochures, films, and similar materials.

There is little indication that either large amounts of effort or money is invested in extended and fully-integrated educational programs (e.g., workshops, mini-courses, in-service training). Furthermore, the relatively few "formal" educational efforts that have been promoted by nonschool-based organizations tend to be far less completely developed than those formulated by school districts, universities, etc. Thus, while environmental education units created and used by school districts are commonly complete and include comprehensive curricular design, their nonschool counterparts seldom have the benefit of such sophisticated development. The actual materials disseminated (brochures, course outlines, teaching manuals, etc.) usually fail to provide sufficiently detailed insights into the instruction's intended philosophical objectives, pedagogy, skill development, methodology and content. They may, however, provide useful generalized introductions or samples.

Utilization of core themes, such as those introduced in Chapter 3 and elaborated in Chapter 6, is notably rare among nonschool-based environmental education programs--and much of what does appear is by implication only (e.g., environmental unity and general systems). The evidence suggests, however, that if fully and appropriately developed core themes were available, they would offer numerous benefits to and receive wide acceptance from nonschool-based organizations.

In summary, it is clear (e.g., Table 4.15) that nonschool-based organizations make many significant contributions within the spectrum of environmental education. In only a few cases can it be argued that any given individual nonschool- and/or outdoor-oriented organization fully characterizes the integrative intent of the Environmental Education Act through its activities; but it is significant that these organizations, taken together, represent an impressive array of contributions in the environmental education field. Furthermore, such organizations have been among the most competent and effective proponents of wise environmental management and environmental education.

Interrelationships and Conclusions

The Organization of Environment-Based Education

There is a considerable amount of environment-based education occurring both in formal school or university settings as well as in informal or non-institutional contexts. However, an analysis leads to the conclusion that environmental education as a whole in the United States is fragmented. Leadership is lacking, in large part because of the interdisciplinary thrust that is inherent to environmental education is not compatible with the disciplinary organization of most educational institutions. Thus, there are few spokesmen for environmental education within the school systems. Similarly, there are few environmental education coordinators comparable to the coordinators for science, social science or reading found in most large school systems or at the state education office level . . . nor are there coordinating mechanisms within or between the large number of federal, state, and local agencies which are involved in the environmental education process.

Competition, not coordination or cooperation, seems to best characterize the various elements in the environmental education system today. In the discipline-oriented, education establishments, budgetary considerations figure prominently in the situation.

There are few examples of certification in environmental education. Thus, while some environmental education is a growing part of the elementary and secondary curricula, it has little formal recognition in the teacher-training curricula in higher education institutions. In most instances, teacher-training programs provide no courses labeled environmental education nor any conceptual structure.

The lack of leadership and coordination is manifested in several ways. There is an observed tendency for subject matter duplication at all levels in both formal education systems and nonformal environmental education programs. Equally serious (or at least confusing), is the presentation of contradictory environmental education, as often occurs between disciplines in formal environmental education systems and in a few cases between agencies of the federal and state governments. Lastly, there have been few attempts to marshal and integrate forces or groups which have great potential for improving environmental education; that is, groups such as professional associations of librarians, administrators of zoological parks and botanical gardens, museum curators, research institutes dealing with specific environments or environmental problems, or national environmental groups.

The Content of Environment-Based Education

With respect to the content of environment-based education, emphasis is commonly placed upon the examination of environmental systems. Less frequently but still commonplace, is the study of environmental problems--oilspills, pollution, litter, energy adequacy and the like. Fully integrated, interdisciplinary environmental education programs are in short supply in school systems, higher education or in informal environmental education programs. The integration which is widely regarded as fundamental to environment-based education is lacking, primarily because of the strong disciplinary organization which characterizes our education systems, both formal and informal. Such integration is lacking even in the elementary grades where strict disciplinary divisions of subject matter are uncommon; this apparent paradox is likely explained by the fact that the teacher training process itself is heavily structured along disciplinary lines.

Multidisciplinary cooperation does exist in some programs, but the "turn-teaching" model prevails, and does not provide an effective means of integrating the man-environment interface.

Closely associated with this lack of integration is the absence of a commonly accepted conceptual framework. The conceptual frameworks used in teaching environmental education are, in the main, those provided by the disciplines involved, and tend to reflect more narrow considerations of man-environment interrelationships than is customarily called for by environmental education leaders or intended in environmental education legislation. Moreover, there is a relatively stronger emphasis placed on natural and physical aspects of the man-environment interface than has been recommended in most environmental education legislation; generally, the impacts on, or of, man are treated only in passing. Similarly, considerably more attention is given to rural and wilderness environments than to man-made ones such as cities or human micro-environments. This is not to suggest the focus on natural science subject matter is wrong, but rather that half of the man-land equation has been largely ignored.

Surprisingly, another important characteristic of much environmental education is a lack of emphasis on the interdependencies existing between the various elements and processes of the environmental system. Specific environmental problems (litter, pollution, etc.) are addressed and individual systems are studied; however, there is little attempt to relate one environmental system to another, to relate these systems to environmental problems, or to relate one problem with another. In short, a holistic viewpoint seems to be missing.

Certainly there is little indication that core themes, such as those suggested in Chapter 3, are utilized at any level in either the formal or nonformal systems; although approximately one third of the respondents in all categories utilize subthemes such as land use, population, and especially pollution. Because there is an absence of principle core themes in the content and organization of environmental education, it follows that this problem is reiterated in terms of pedagogy, outdoor-oriented education, and teacher training.

In nearly all environmental education endeavors, there is a clear tendency toward the localization of inquiry; emphasis is given to local environmental systems and local problems without reference to the fact that these problems and systems are often manifested or initiated at the regional, national or global levels. Again, but this time in the scale context, half of an equation has been omitted.

Finally, the content of environment-based education is strongly phenomenological. Studies are made of systems, things, events; little attention is given to evaluating policies, values, or attitudes, nor is there attention given to assessing or resolving the conflicts among these. This seems a logical outgrowth of the disciplinary heritage of those fields which are most active in environmental education.

Pedagogy in Environmental Education

Environmental education is characterized by a wide variety of teaching strategies and methods. Because the field draws heavily upon natural and physical sciences, there is some tendency for the teaching approaches and procedures to reflect those that are common (or even unique) to the biological, ecological, or earth sciences. Thus, field trips, laboratory work, and lecture-demonstration approaches are commonplace, as is an emphasis upon data collecting skills such as identification, observation, and measurement, and the analytical procedures of the disciplines with which the instruction is affiliated. It is important to note that little evidence exists which suggested that skills are being taught that are uniquely related to man-environment studies.

The types of media used in environmental education present no obvious patterns. Because of the controversial nature of some environmental problems, however, media materials are frequently available. These come especially from the private advocacy sectors, often represent extremes of the environmental spectrum, and are somewhat slanted at best, blatantly propogandistic at worst.

In general, environmental education in formal settings shares with other subject areas the emphasis on cognitive learning. Information transfer is emphasized to the near-total exclusion of problem solving. Little emphasis is given to the affective domain, except perhaps in some of the more value-system-oriented efforts of private organizations.

In summary, with respect to pedagogy, environmental education takes on those characteristics which are identified with the major disciplines which dominate in the formal education systems or, in the case of nonschool public and private sectors, the approaches are customary vehicles those organizations have previously used in their educational efforts. The groups that teach and develop environmental education have not appreciably altered the on-going proportions of various pedagogic methods. Skills development, problem solving, cognitive learning, value system evaluation, and innovation in teaching methods are used in about the same relative frequency as they were before environmental education emerged as a subject.

The Outdoor Traditions in Environmental Education

Among those who regard themselves as environmental educators, outdoor education is a strong tradition. Indeed, in many instances environmental education and outdoor education are interchangable terms. As with the pedagogy of environmental education in general, the objectives and the activities of outdoor education are closely associated with those of the traditional disciplines which comprise or dominate them. Thus, field techniques are patterned after the normal content of methods courses in the earth sciences, geography or biology; nature study and/or outdoor laboratories closely follow courses in the life sciences; and survival or naturecraft courses are molded from their physical education or recreation ancestry. Integrated attempts to bring some or all of these varied teaching strategies and subject materials into a single program or course occur in a few instances, but on the whole these are only rare situations where accepted environmental education objectives are addressed in an integrated manner. This seems to be attributable, in part, to the under-representation of the social and behavioral sciences in environmental education, and the lack of outdoor education traditions associated with these fields.

Career Education in Environmental Education

Some environmental education programs are explicitly oriented towards vocational training in environmental areas, particularly environmental technology. In the higher education sector, some minors (and even less frequently, majors) have been developed in environmental studies, environmental science, or environmental education. These are partly in response to faculty/student demand; partly in response to the need for an edge in the tight job market. The latter is especially useful for engineers, teachers, and planners. A very few two-year colleges have introduced environmental technologist training. The bulk of environmental education, however, is geared to improving general awareness about the environment, environmental problems and man's relationship to them.

Moreover, education about careers tends to be closely associated with traditional employment opportunities, rather than towards those that are peculiar to the broader environmental field. Thus students are exposed to information about careers in forestry, geology, engineering, and other vocations which have close associations with the natural environment; little information seems to be made available about opportunities in environmental planning or management, pollution-control technology, and similar occupations. In fairness, it must be recognized that these latter positions have yet to be clearly identified or described by their proper names; employers continue to advertise under traditional labels and descriptions.

Transferability and Implementability of Environmental Education Programs

Existing environmental education programs are relatively easily transferred from one educational setting to another insofar as organization and content are concerned. What institution-specific characteristics they do have seem to be readily surmountable. There are, however, some important exceptions to this generalization. Firstly, many of the major national curriculum projects are quite costly to implement; they require purchase of expensive equipment and materials and sometimes present high operating costs. Secondly, a few environmental education programs are geared to relatively unique local environmental conditions, conditions which are not likely to be replicated in another location. Thirdly, the few highly integrated interdisciplinary programs which do exist cannot be readily transferred into institutional settings in which disciplinary traditions are deeply entrenched.

CHAPTER 5

ENVIRONMENTAL EDUCATION ACT OF 1970: INTERPRETATION, SURVEY AND THE ARIZONA CASE EXAMPLE

Introduction

A primary purpose of this contract has been to discover the manner and extent to which environmental education activities in the United States reflect the basic objectives of the Environmental Education Act of 1970 (Public Law 91-516) and the Environmental Education Amendments of 1974 (Public Law 93-278). Within the time and budget constraints of the project, it was recognized that it would not be possible to accomplish a comprehensive quantitative testing program and analysis of the thousands of environmental education activities in the nation. However, an in-depth assessment at the local scale, following and expanding the format of the national survey (TEEP), would reveal relationships and/or the lack of relationships between existing environmental education and the Act.

The methodology included the following steps:

1. Determine the relationships between the language of the Environmental Education Act of 1970 and its amendments on the one hand, and its potential expression for the individual and society on the other hand.

2. Define the institutional and cultural sectors of American society that have the potential to participate in environmental education.

3. Develop a model and survey instrument which helps determine the type and degree of effort these sectors currently and potentially may contribute to environmental education. Requirements for the survey instrument include:

a. Identification of activities, materials, and policies which reflect mandates of the Environmental Education Act of 1970; its amendments of 1974; and Federal Register interpretations.

b. Transferability from one region or locale to another.

c. Inclusion of all sectors that may impact on the environmental education process.

d. Accommodation to the various scales or levels at which environmental education may occur.

e. Identification of linkages existing between various sectors, scales, and chronologies in the educational process.

f. Identification of the motivations and values that relate to environmental education activities.

g. Delineation of existing environmental education subject matter.

h. Delineation of existing environmental education pedagogies and methodologies.

4. Include cross-reference with the national (TEEP) results.

5. Test and revise the survey instrument.

6. Test, evaluate, and revise the instrument through actual survey implementation in order that:

a. The final product is, with minimum adjustment, transferable to other regions, states, or localities.

b. A comprehensive survey is accomplished for one area of the United States.

c. Trends and statistical inferences may be drawn from statistical analyses of the survey results.

The remainder of this chapter describes the development of the rationale and foundation on which the survey instrument is based, the development of the actual survey instrument, and its implementation in an Arizona case study.

The Environmental Education Act

Before proceeding specifically to the survey instrument, the Environmental Education Act, associated amendments, and/or official rulings had to be both broadly and specifically interpreted. This was necessary if the survey instrument was to properly answer the question: To what degree do (or do not) environmental education activities reflect the intent of Public Laws 91-516 and 93-278?

The Environmental Education Act is a rather unusual piece of legislation in several respects. Three significant attributes of the Act are:

1. The Act reflects the "sense" and feeling of the Congress and the public in the midst of the environmental groundswell of the late 1960's and early 1970's. In this respect it is not written in a highly specific manner as are most public laws, but rather it addresses a broader set of national objectives regarding environment.

2. The law--although it deals with education--does not restrict its scope to questions of formal and institutionalized education; it addresses the entire national community and its role in the development of the individual citizen from cradle to grave.

3. The Act is not a regulatory act; that is, it does not establish rules and statutes which require elaboration and definition through the usual judicial channels. This is typical of laws regarding education--where basic policies and philosophies may be expressed at the federal level, but acceptance and implementation are accomplished at state or local levels.

The Act does, however, provide some financial support in order that implementation may be federally subsidized at community or institutional scales.

Interpretation of Law

Most Acts of Congress are fair game for extended interpretation and amplification through the judicial process.[1] The Environmental Education Act of--as with most education-related laws--is not normally affected in this manner. Instead, it exerts its greatest influences through the establishment of agencies and funding mechanisms, whereby federally-supported programs are used to promote, develop, and initiate philosophies or objectives stated in legislation. Essentially it is a statement of a philosophy of environmental education. It is a "hard" act only in that it established the Office of Environmental Education and the Advisory Countil on Environmental Education within the Office of Education, DHEW, and provides funding for the implementation of grants and contracts within that office. It is up to local and state school systems to implement related educational activities as they see fit. Congressional rhetoric and federal funds converge insofar as grants and contracts subscribe to directions implicit in the Act.

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[1] The National Environmental Policy Act of 1969, PL 91-190, is typical of legislation subject to intensive judicial action. One example of that law's interpretation, the Calverts Cliff Decision, is cited as a counterpoint to the nonjudicial and nonregulatory manner in which laws such as the Environmental Education Act of 1970 may be perceived. NEPA, which also was broadly stated by Congress, has evolved to represent very specific rules and actions on the part of the federal government. That evolution has taken place through a series of law suits, whereby the courts have interpreted the "spirit" of the Act and how much latitude Congress intended to impart to the Environmental Protection Agency. The Calvert Cliffs Nuclear Plant Site in Maryland is a case in point. Nowhere in PL 91-190 is it explicitly stated whether environmental impact statements and/or responses to environmental impact statements are required retroactively; that is, where site development and plant construction have already been approved and initiated. In a suit brought by the National Wildlife Federation and the Sierra Club against the Atomic Energy Commission--and which travelled the full regulatory and judicial path to the Supreme Court--the high court decided that Congress intended such retroactive action. Thus the Environmental Protection Agency was given (through the E.I.S. mechanism) significant operational and regulatory powers; these have been interpreted to cover areas beyond nuclear energy development. This is the traditional manner in which most broadly-based Congressional statements achieve some precision of intent.

Any interpretation of the Environmental Education Act must be related to three documents of only a few paragraphs each: (1) the original Environmental Education Act, Public Law 91-516; (2) Environmental Education Amendments of 1974, Public Law 93-278; and (3) the DHEW Office of Education interpretative rulemaking as set forth in the Federal Register, January 30, 1974. These documents and accompanying Hearing Reports (e.g., House of Representatives Report No. 93-402, Extending the Environmental Education Act, Report to accompany H.R. 3927, July 26, 1973) provide what little official interpretation and additional definition of the Act that is available.

If any evolutionary trend is apparent in these documents, it is the tendency to shift the emphasis from the traditional nature-oriented and ecological areas of environmental education to a broader, interdisciplinary definition. Thus, the significance of socio-economic, cultural, and political implications of environmental education and the environmental decision-making process is given equal emphasis . . . an integrated wholistic approach, in which man and nature are not separated, is suggested. An additional shift in the scope and purpose of the Act is, perhaps, that financial assistance is addressed to all institutions that may play a role in the development of environmental education, and less predominantly to the formal K-university area.

Expression in Value Terms

The Act incorporates value judgments in that "It is the purpose of this Act . . . to encourage understanding of policies, and support activities designed to enhance environmental quality and maintain ecological balance, while giving due consideration to the economic considerations related thereto," or "One of the chief goals of environmental education is to help us learn how to proceed as a society toward a condition of 'productive harmony' with our environment, where destructive change is minimized and healthy change can proceed" (DHEW, Office of Education interpretative rulemaking as stated in the Federal Register, January 30, 1974).

A task of the project, therefore, was to view the field of environmental education in terms of objective and substantive data systems on the one hand and perceived value systems on the other. In this respect, the Project does not attempt to determine "good" or "bad" environmental education; rather it identifies what cognitions are present in the community's expression of environmental education . . . and how well these perceptions and activities fit the stated objectives of the Environmental Education Act and its amendments.

Environmental Education and the Individual

The scope and totality of environmental education encompasses more than the impact of single programs or activities. Thus a schematic model was developed to identify the tangible and intangible elements and processes which have impact on the individual and society throughout life. The following assumptions, derived from the Act, are:

1. Environmental education should be an on-going aspect of life and society from birth to death.

2. Environmental education is not solely a function of our formal educational institutions, and in fact, is accomplished or can be accomplished through all the cultural and economic associations an individual experiences.

3. Environmental education is to some degree necessarily involved in value judgments and value statements.

4. Environmental education involves understanding of alternative uses and management of environment.

5. Environmental education should produce a well-informed citizen who may participate intelligently in the decision-making process at either the professional or citizenship levels.

Given these assumptions, a diagramatic model of how environmental education is impacted on the individual was developed. This is expressed in a series of figures (5.1-5.3) and explained below.

In Figure 5.1A, the individual, and the aggregate society, are shown as impacted by four sectors. Two of these are strongly formalized institutionally: (1) the Government Sector, and (2) the institutionalized Education Sector. Each of these impact sectors is comprised of a variety of subsectors appearing at different scales, different ages and under different jurisdictional controls. These variables for Government and Education are diagramed in Figures 5.2A and 5.2C.

The impact by the various elements and processes of society on the individual are extremely complex. It was convenient to divide these into a Socializing Sector and an Advocating Sector. Some of the elements and scales involved in these sectors are given in Figures 5.2B and 5.2D. Both sectors are productive of value systems at all human scales from the family upward.

In roughly generalized terms, however, it can be said that the Socializing Sector is more covert in influencing an individual's attitudes and beliefs than the Advocating Sector, which has consciously overt goals.

The forces and institutions that influence man are, of course, extremely complex and involve a large number of feedback mechanisms and interrelationships. These are schematically represented in Figures 5.1B, 5.1C, and 5.3. The series of concentric circles about the individual represent the increasing localization and detail of these inputs as one moves away from the center. Indeed, the diagram may be expanded further (as was done in the development of the survey population). For example, the detailed Government Sector case (Figure 5.2A) can be spilled out into an organizational and agency chart reflecting all government functions in Arizona from federal through state, county and local levels.[1]

It is worth noting that another impact sector is shown by the "bubbles" in the outer circle of Figure 5.3. These represent composite inputs--such as media, pop culture, broad-spectrum advisory groups--that are not easily categorized in four principal sectors. Thus, five sectors were eventually

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[1] It is important to note that the purpose of the schematic model is simply to provide a framework from which a survey instrument can be logically developed. It is not intended as a definitive, formal model of the Act, but rather an internally-consistent approximation for Project use. For example, it is not really terribly important whether the distinction between the Socializing and Advocating Sectors holds up to rigorous evaluation. Both inputs exist in the development of the individual. The distinction between the Advocating and Socializing groups is a simple convenience for the later census of institutions, organizations, agencies, and individuals who might play some role in environmental education. For example, in the context of environmental education it was decided to categorize churches and service organizations in the Socializing Sector. They might easily have been categorized in the Advocating Sector were we concerned with some subject other than environmental education.

FIGURE 5.1

SECTORS CONTRIBUTING TO THE ENVIRONMENTAL EDUCATION PROCESS AND ASSOCIATED VALUES

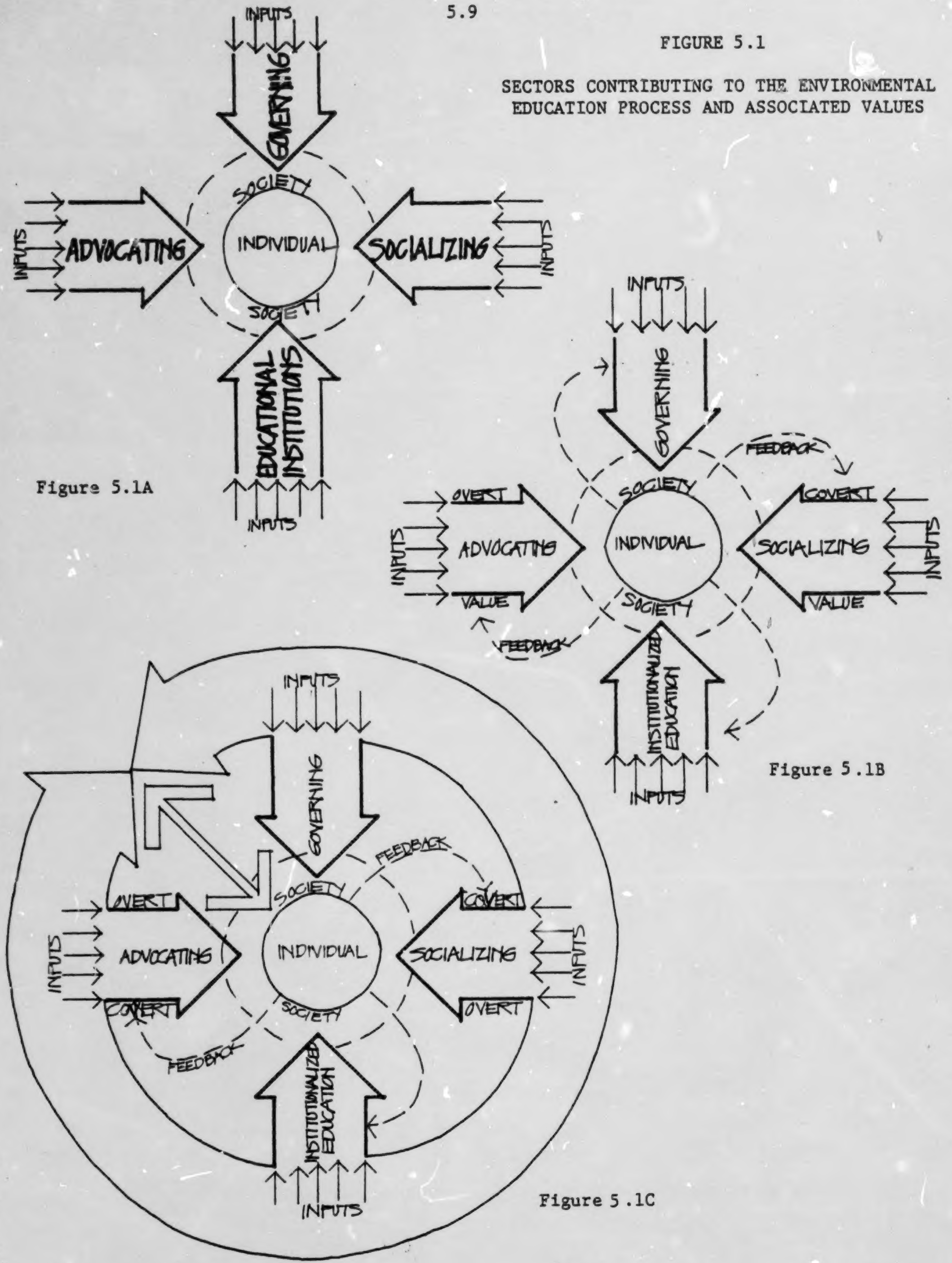


Figure 5.1A

Figure 5.1B

Figure 5.1C

FIGURE 5.2

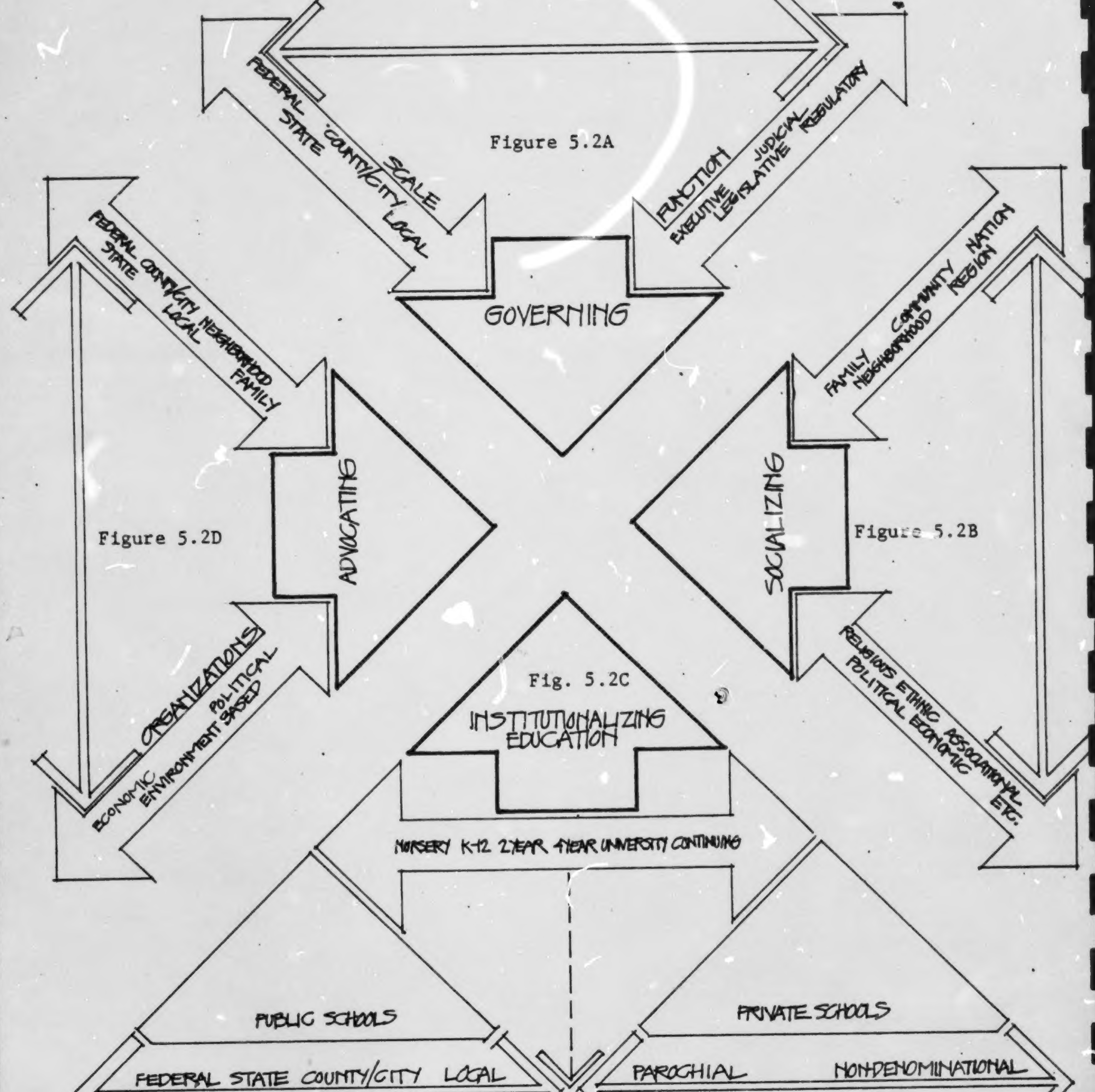
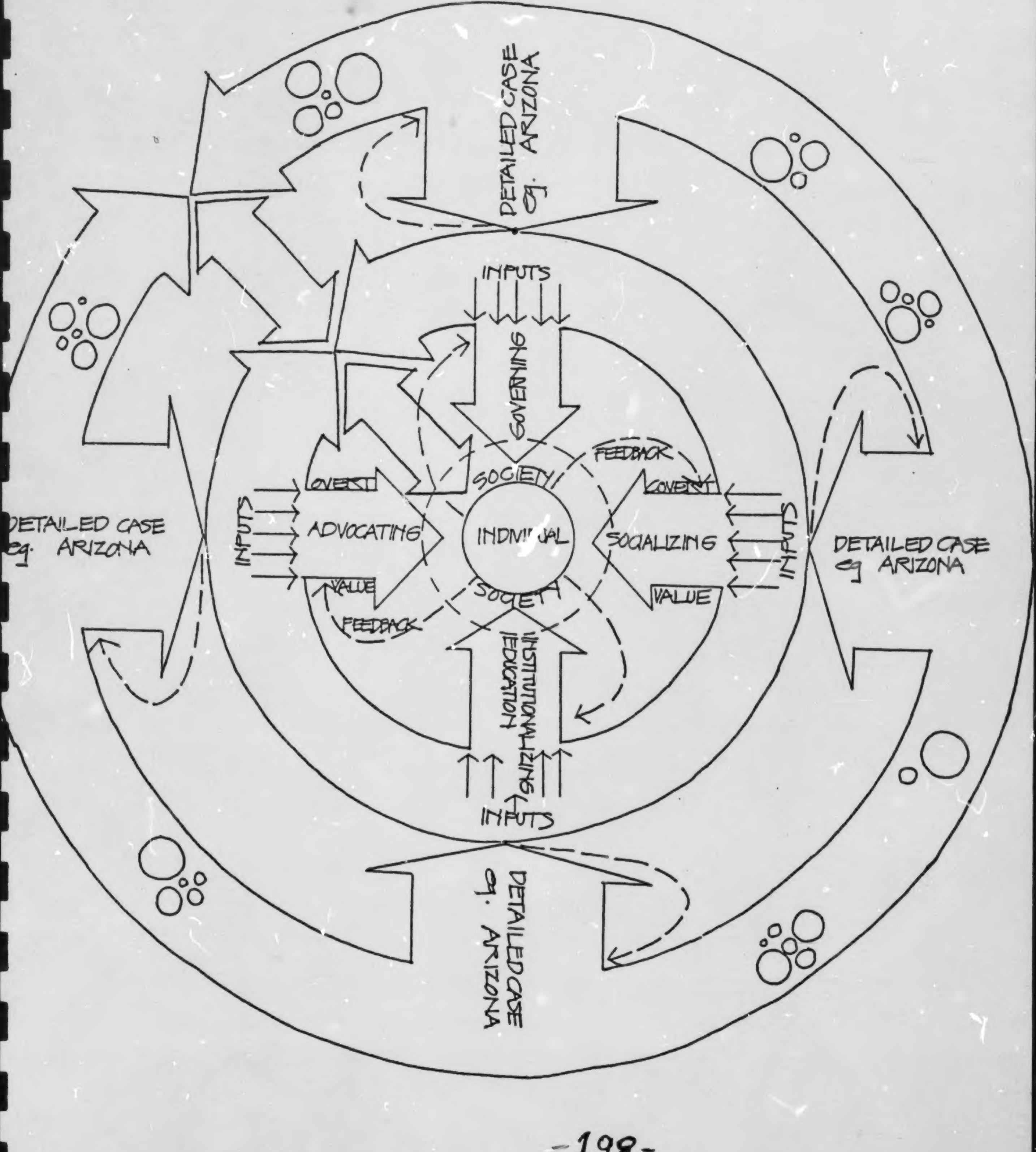

SCALE
FEDERAL STATE COUNTY/CITY LOCAL
FUNCTION
EXECUTIVE LEGISLATIVE JUDICIAL REGULATORY
Figure 5.2A
GOVERNING
FEDERAL COUNTY/CITY NEIGHBORHOOD
STATE LOCAL FAMILY
FAMILY NEIGHBORHOOD COMMUNITY REGION NATION
ADVOCATING
Figure 5.2D
SOCIALIZING
Figure 5.2B
ORGANIZATIONS
ECONOMIC ENVIRONMENT BASED POLITICAL
RELIGIOUS ETHNIC ASSOCIATIONAL
POLITICAL ECONOMIC ETC.
Fig. 5.2C
INSTITUTIONALIZING EDUCATION
NURSERY K-12 2YEAR 4YEAR UNIVERSITY CONTINUING
PUBLIC SCHOOLS
FEDERAL STATE COUNTY/CITY LOCAL
PRIVATE SCHOOLS
PAROCHIAL NONDENOMINATIONAL

FIGURE 5.3



○○ COMPOSITE INPUTS:
MEDIA, ADVISORY GROUPS, POP CULTURE, FOUNDATIONS ETC.

surveyed: Government, Education, Advocacies, Socializing organizations, and the Bubble groups.

Finally, it is suggested that while the present purpose is particularly concerned with the integrated result of environmental education, the schematic definition also provides an approximation of any educational process involving value systems.

A Survey Instrument for Environmental Education

It was necessary to develop a survey instrument which reflected the schematic model previously described, as well as to determine the scope of environmental education in a given locality, its degree of area integration, and relationships to the Act. It was determined that the instrument would be a master survey questionnaire; contain components of the Environmental Education Act and its associated amendments and rulings; and that the basic format would be primarily of the objective response type but some open-ended questions would be included--especially those that helped identify core themes and integrating linkages. Further, that the questionnaire would be of a self-administered type that would solicit, either directly or indirectly, some expression of values; and it would be so structured that analysis between question responses and the five impact sectors could be accomplished.

The Environment Education Survey Instrument was developed over a two-month period by the Project staff, Steering Committee members and consultants associated with the Survey Research Laboratory, University of Illinois. The finalized instrument provides for 156 possible responses, including 125 objectively-constructed questions and 31 response items relating to nine open-ended questions (Appendix C).[1] The relationships of the questionnaire to the Environmental Education Act and associated interpretations can be determined from Tables 5.1, 5.2, and 5.3.

Implementation of Survey Instrument

To determine the usefulness of the survey instrument as well as the schematic model, it was administered locally within the State of Arizona. A site had to be chosen for the development and testing of the survey instrument and Arizona was selected for fairly straightforward reasons. Firstly, given the short research period and the location of most of the project staff, Arizona was convenient and accessible. Secondly, the state's low population and tight infrastructure was conducive to a study that had, at the same time, to be comprehensive and short-termed. Thirdly, the economics of running the survey in Arizona were attractive compared to the cost of an in-depth study at another location and on unfamiliar ground.

Finally, considering that only one major test was to be accomplished, the selection of any location inevitably would include responses characteristic to that area. Thus, in the long run it didn't make any difference which area was utilized. The critical factor was that a population was available in which to test a transferable system for evaluating environmental education.

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[1] The survey questionnaire was subject to three trials and associated alterations before it was broadly circulated in the Arizona community. This larger pilot survey is the basis for the additional critique and recommendations presented in Appendix D. We believe that the survey instrument is transferable, but users should take into account the Appendix D suggestions.

TABLE 5.1

RELATIONSHIP OF QUESTIONNAIRE ENQUIRIES TO THE ENVIRONMENTAL EDUCATION ACT OF 1970

Excerpt from PL 91-516 and PL 93-278	Selected Related Survey Questions[1]
Encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance	9a-c, 19a-c, 25a-o, 26a-c, 27a-c, 28a-d, 29c
Support of activities designed to enhance environmental quality and maintain ecological balance	2, 6a-d, 25a-o, 26a-c, 27a-c, 28a-d, 29d-e
Provide support for the initiation and maintenance of programs in (EE) at the elementary and secondary levels	19a-c, 25f, 26a-c, 27a-e, 28a-d
Disseminate curricular materials and other information for use in educational programs throughout the nation	3a, 3b, 3f, 14, 17a-b, 18a-c, 28a-d
Provide training programs for teachers, other educational personnel, public service personnel, and community, labor, and industrial and business leaders and employees, and government employees at state, federal, and local levels	11, 12-b, 28d
Provide for the planning of outdoor ecological study centers	6b, 7a-b, 15c, 25ℓ
Provide for community education programs on preserving and enhancing environmental quality and maintaining ecological balance	4a, 12b, 15e, 29b
Provide for the preparation and distribution of materials by mass media in dealing with the environment and ecology	13a-d

TABLE 5.1--continued

Excerpt from PL 91-516 and PL 93-278	Selected Related Survey Questions[1]
The law deals with man's relationship with his natural and manmade surroundings and includes the relation of:	4a-c, 5, 10a-g, 29a
Resource allocation & depletion	4c, 4g, 10g
Conservation	4a, 4d, 4f, 4g, 10g
Population	4h, 10g
Transportation	4i, 10g
Technology	4c, 4i, 10g
Urban and Rural Planning	10g
Pollution	4d, 4h, 10g
to the total human environment	4a-i, 5, 10g, 29a
Consideration of economic considerations related to maintaining ecological balance	4c, 4g, 4i, 10g, 29a

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[1] Question numbers given below refer to the question in the survey instrument.

TABLE 5.2

RELATIONSHIP OF QUESTIONNAIRE ENQUIRIES TO THE FEDERAL REGISTER PROPOSED RULEMAKING

Excerpt from Federal Register January 30, 1974	Selected Related Survey Questions[1]
I. Areas of Inquiry Appropriate to Environmental Education:	
Applying science and technology to the environment	4a, 4b, 4c, 4h, 4i, 6a, 6d, 29f
Human settlements	4c, 4e, 4i
Food production	4a, 4b, 4g
Energy production	4b, 4c
Population dynamics	4a, 4c, 4h
Transportation	4c, 4e, 4i, 10d-g
Planning	4e-i, 9a
Resource utilization, allocation, depletion, and conservation	4b, 4c, 4g, 10g
Land use	4b, 4e, 4f, 10d-g
Air	4b, 4h, 10d-g
Water	4a, 4b, 4h, 10d-g
Environmental Pollution	4a, 4b, 4d, 4h, 10d-g
Causes and consequences	4a, 5, 9a
Alternative technologies	6c, 9a-c
Implications of implementation	4f, 4h, 6c, 9a

TABLE 5.2—continued

Excerpt from Federal Register January 30, 1974	Selected Related Survey Questions[1]
II. Environmental education programs should:	
Impart information	7d, 13a-d
Stimulate awareness	4d, 13a-d
Provide problem-solving opportunities	7c, 7e
Provide decision-making opportunities	6c, 7c, 7e, 9a-c
Provide condition of productive harmony	4d, 5, 6c, 9a-c, 15d, 16b
Establish a pattern of feedback	7c, 9a, 9c
Provide continuous social diagnosis	9a-c, 13a-d, 15d, 16b
Establish a common methodology for assessing environmental developments	6c, 15d, 16b
Impart ability to change	9c
Develop perception and understanding	4d, 5
Evaluate alternative solutions	5, 6c, 9a-c
Assess benefits and risks	9a-c
Develop skills and insights	6a-d, 7a-e

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[1] Question numbers given below refer to the question in the survey instrument.

TABLE 5.3

RELATIONSHIP OF QUESTIONNAIRE ENQUIRIES TO SCALES, LINKAGES, VALUES, AND CORE THEMES

Survey Topic	Selected Related Survey Questions[1]
Scale of activities	8a-g, 12a, 12b, 14, 15a, 15b, 16a, 19a-c, 20, 22a-o, 23a-c, 25a-o, 26a-c
Linkage and communication networks	3f, 10c-g, 12b, 13a-d, 14, 15b, 15d, 16a, 16b, 17a, 17b, 18a, 18b, 21a, 21b, 22a-o, 23a-c, 25a-o, 26a-c, 27a-c, 28b-d
Value-related	3g, 7a-e, 9a-c, 10g, 21a, 21b, 27a-c, 28a-d, 29a-f
Core themes	5, 9c, 10g
Minor (sub) themes	4a-i, 5, 9a, 9b, 10g

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[1] Question numbers given below refer to the question in the survey instrument.

The questionnaire was addressed to some 1,220 organizations and agencies in the Advocacy, Social, Government, Education and Bubble Sectors. These represent a majority of the organizations operating above the small unit or departmental level in both urban and rural areas of the state. All types of agencies and organizations were included in the survey, even those that were not considered likely participants in environmental education. In this manner, preconceived notions of who is or is not involved in environmental education was avoided. By interviewing all sectors, the resulting data delineate what facets of the Act are or are not being fulfilled.

The questionnaire also provides insights into the perceptions of the respondents. As in many things, environmental education is defined in the eye of the beholder, and a variety of interpretations are available. The questionnaire allows individuals and organizations to indirectly put their definition to environmental education. Not surprisingly, some organizations that the Project staff believed to be doing environmental education work per the Environmental Education Act, claimed that they were not involved in environmental education, and vice-versa.

The largest number of questionnaires were sent to the Education and Government Sectors; 543 and 305 respectively. The Education group represents a 100 percent representation of school districts and high schools, two-year colleges, colleges and universities, but reflects only a partial sample of elementary schools, school departments and specific classroom situations.

The government sample included all major federal, state and county offices. At the town and city level, the survey was implemented according to population. For the two metropolitan cities (Phoenix and Tucson), eleven agencies were contacted in each place (mayor, city manager, economic development office, fire department, garbage and trash collection, libraries, parks and recreation, planning department, real estate department, sign enforcement department, and the airport). For the 11 cities between 10,000 and 99,999 population, 5 offices were contacted (mayor or manager, planning department, parks and recreation, public works, libraries). In the 12 cities with a population between 5,000 and 9,999, only 2 contacts were made, the town office and the planning office. For cities under 5,000 persons only a single contact was made at the town office.

Advocating groups (228) are also proportionately well represented; however, the socializing area (122) could be dramatically enlarged if, for example, every church, parish and service organization chapter is contacted. Also, while government agencies and educational units are easily identified through master organization charts and directories, Socializing and Advocating Sectors are not efficiently cataloged. A majority of information was gathered utilizing the Conservation Directory, the Arizona Directory of Conservation & Environmental Organizations, the membership list of the Governor's Advisory Commission on Environment, membership directory of Advisory Council on Environmental Education, the directory of the Southern Arizona Environmental Council, and telephone directories. Fugitive sources were also heavily used for this information. As expected, only a small number of Bubble organizations existed (22).

Environmental Education in Arizona:

A Case Study

Implementation of the survey instrument in Arizona provided not only a means to evaluate the questionnaire under pilot conditions, but also, as a valuable by-product, provided information on the status of environmental education within the state. This section presents selected tabular results and conclusions for Arizona. These data are considered, in turn, in the development of broader conclusions and recommendations given in Chapters 1 and 6.

Of the 1,220 questionnaires mailed, 706 were completed and returned in time to be processed by the Survey Research Lab, University of Illinois. The response rate of 49.8% is considered acceptable, and the returns are representative of the environmental education situation in the state of Arizona (Table 5.4). That the return is representative is also substantiated by the fact that an earlier test run of 182 questionnaires provided essentially the same statistical results.[1]

Of the total respondents, approximately 28% indicate that they had no involvement with environmental education; and another 17% claim involvement to only a "little extent" (Table 5.5). Of the 65% who claim some or great involvement, there is considerable variation between the sectors (e.g., Advocacy, Societal, Government, Education, Bubble); the lowest response is 48% for the Societal Sector and the highest response, 90% for the Bubble Sector. All of these positive responses, however, may be judged an overestimation in that a fewer number of respondents later in the questionnaire answered specific detailed questions about environmental education activities. This presumably is because they simply refused to respond, made a mistake in the skip pattern, or actually were so little involved in environmental education that they were unable to answer. A better representation of who is involved in environmental education is given in Table 5.6. In any case, it is clear that the survey population does not feature only those organizations where the primary or sole mission is environmental education; a rather small percentage of surveyed organizations devote more than half their organizational effort to the subject (Table 5.7).

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[1] Over 125 additional completed questionnaires were received after the project's closing date (May 9, 1975); they continue to trickle in at the time of this report (June 30, 1975). The overall effect of the additional responses is to increase the percentage of responses in the Educational, Societal, and Advocacy Sectors. It is worth noting that telephone follow ups to delinquent respondents often elicited the response that they had not returned the questionnaire because they were not active in any way in environmental education. This means that the overall percentage of organizations not at all involved in environmental education (Table 5.5) is probably higher than the sample indicates. At a later date final analysis of all Arizona questionnaires will be accomplished for local utilization.

It is also apparent that environmental education is not a term that can be restricted to teaching, whether in a formal or nonformal setting (Table 5.8), as there are as many organizations involved in disseminating environmental education materials as there are involved in teaching; program development also receives relatively heavy emphasis. Percentage involvements within sectors follow basic definitions and expectations for those source areas. Further, it must be noted that most of the analysis in the following sections does not include those organizations which had no involvement at all with environmental education.

The Organization of Environmental Education

At the outset five sectors (types) of organizations in environmental education were hypothesized. In general these can be grouped into two categories--formal educational institutions, and those organizations which are not primarily educational institutions. Approximately 190 of the organizations having environmental education activities are designated as formal educational institutions. Not surprisingly, almost half of the organizations have come into existence since 1968 (Table 5.9), although as a group the non-formal organizations have been engaging in environmental activities over a longer period of time.

Responses indicate a remarkably heavy emphasis on multidisciplinary and interdisciplinary presentations of environmental education, regardless of sector (Table 5.10). Analysis of two- and three-way tabulations, however, reveals that much of the perceived multidisciplinary and interdisciplinary format leans toward some combination of sciences, aesthetics, and nature. Among those organizations whose activities are oriented toward a single discipline, the emphasis is clearly on natural and physical science areas.

Considerable attention was given in the questionnaire to the existence and character or inter-organizational linkages and estimating the strengths of these linkages insofar as environmental education is concerned. The government sector is the leading source of support for environmental education in general, but there are considerable variations in this pattern related to sector (Table 5.11). Consistent with this finding is the observation that government sector respondents were preeminent in lending support to environmental education activities for nearly every other category (Table 5.12).

Moreover, supporting groups which were most frequently specified by name were all federal or state organizations or school districts (Table 5.13). Only two "conservation groups" and two corporations were cited more than once as supporters of environmental education.

The list of recipients of support is more varied; in most instances those organizations which do contribute resources to environmental education do not do so financially. Only fourteen percent of all organizations involved in environmental education allocated financial aid to other organizations (Table 5.14). A larger number contribute equipment and materials, while contribution of staff time seems to be the most common form of support; public lectures and the provision of technical aid are especially prominent.

Respondents indicate little use made of national curriculum projects in Arizona--only 25 organizations (less than 8 percent of those with environmental education) utilized such programs. BSCP (8), ESCP (8), HSGP (3) and SCIS (4) were the only such projects mentioned by more than one organization. Similarly, few textbooks are universally used; only fourteen were cited by as many as two organizations. The Elementary Teachers Guide to Environmental Education published by the Environmental Education Council of Arizona was used by four respondents.

Nearly one in four organizations indicated an affiliation with "Environment" or "Conservation-Oriented" organizations, nearly all from the advocacy, societal and governmental sectors. In general these linkages had a strongly local flavor. Of the eleven organizations cited more than three times, six were specifically "Arizona-Based" organizations.

In summary, though linkages between organizations exist, they are not uniform. Those that do exist tend to be local and tend to involve governmental agencies. Communication through the system mostly involves personnel and, to a lesser extent, informational materials. The weaknesses of the links is further supported by the respondents' generally low regard for the extent of the coordination of environmental education activities in general, and within their own sectors in particular (Table 5.15).

The Targets of Environmental Education

In general the target audiences for environmental education are local. Over 40 percent of the organizations indicate that their own organization is the primary audience for their environmental education activities (Table 5.16). One in three organizations indicate a local or community audience as their primary goal. In contrast, only one of all the organizations surveyed indicated that they had a world wide audience and fewer than one in twelve Arizona organizations have regional or national targets.

Sector differences from these general patterns are apparent, and in large part expectable. Thus the relatively higher state-wide and national emphasis of governmental organizations is consistent with the jurisdiction of those agencies. The introspective tendencies of educational organizations probably reflects the emphasis on teacher-oriented programs. More specifically the targets indicated by the formal educational organizations are related to the makeup of the sample, which in turn reflects the structure of the Arizona formal education system, with its emphasis on youth. Of special interest here is the fact that adult education receives relatively little attention (Table 5.17). Among non-formal educational institutions, the situation is reversed; here over two-thirds of organizations indicated older-age categories as targets.

The Content of Environmental Education

Nearly all organizations claimed to place at least some emphasis on the interrelationship between man and environment (Table 5.18). Yet the overall pattern of program development seems to give heavy emphasis to physical and natural sciences (Tables 5.19 and 5.20). For example, two-thirds to three-quarters of environmental education respondents rate these areas as receiving "some" or "great" emphasis, whereas fewer than half indicated a similar level of emphasis for urban areas. Sectors exhibit some departures from this generalization. Thus formal educational organizations exhibit a natural science/physical science tendency to the greatest degree, while advocacy and societal sectors appear to reverse this pattern. Governmental organizations tend to exhibit a more balanced emphases. As mentioned previously, most organizations claim a multidisciplinary focus (Table 5.10). Interdisciplinary approaches are somewhat less common, though more prevalent than the single-disciplinary orientations.

Most environmental education organizations claim a multi-scale emphasis insofar as geographic orientation is concerned (Table 5.21). However, community/county problems are dealt with by 94 percent of organizations, and there is a regular pattern of declining attention as scale moves to the neighborhood and family in one direction and to region, nation, and world in the other.

Pedagogy in Environmental Education

It appears that traditional reliance upon teaching information and facts extends to most environmental education programs in Arizona (Table 5.22). Most programs incorporate field trips as part of the teaching strategy, and nearly one-half employ the use of specific outdoor sites in their programs. Only one in three indicates reliance upon simulation or role playing techniques. Sectoral differences are not great, although there are some shifts in emphasis. For example, reliance upon outdoor sites is relatively more important among governmental agencies, and is substantially less so among advocacy groups.

Skill development plays an important role in many of the environmental education programs (Table 5.23). Outdoor skills receive special attention in more than half of the programs. Sectoral differences here are predictable; thus, governmental organizations emphasize skill development generally, and in particular for outdoor and field techniques. In contrast, advocacy groups downplay skill development except with respect to organization and communication skills.

Affective teaching strategies are claimed by about half of the programs (Table 5.24). These appear to receive most attention among the advocacy and government groups, and are stressed least by societal and government sectors. Many organizations also depend upon media developed by others (Table 5.25).

Career Education and Inservice Training

Of those groups which have environmental education, about half indicate that they engage in education for careers in the environmental area. Educational institutions and governmental agencies are dominant in this respect (Table 5.26). A number of organizations provide inservice training in teaching or developing programs for their own employees or other groups. This is especially true for government, advocating, and societal groups. Surprisingly, perhaps, it is substantially less characteristic of the education sector.

Nature/Outdoor Orientation

A large number of Arizona respondents indicate the utilization of nature or outdoor-oriented activities in environmental education. Approximately one half of the respondents use outdoor learning sites (Table 5.22) to some or great extent, and 63 percent regularly take field trips. Some 53 percent of queried organizations emphasize the development of outdoor skills, and 43 percent emphasize environmental field methods (Table 5.23). For both of these questions, it is worth noting that the highest percentage responses come from Government, where many of the environmental education activities are internally oriented. Outdoor skills do remain well represented in the Advocating, Societal, and Education areas, but only a little over a third of each of these groups gives some or great emphasis to the academically more substantive skill, environmental field methods. Because of the Arizona natural landscape and lifestyle, it might be expected that nature or outdoor orientations should be higher than the national average. This is indeed the case; the overall national participation in nature and outdoor activities is approximately 33 percent (see Chapter 4).

An additional indicator of the strength of outdoor orientation is the fact that sports and recreational organizations provide better than one third of the support given to Advocacy and Societal Sectors, and 22 percent of the support given to the Education Sector (Table 5.11). Further, the larger number of sources of support identified in Table 5.13 are associated with those organizations or agencies which have an outdoor or natural science base.

Core Themes for Environmental Education

The idea of core themes leading to a clear identification and integration of environmental education has been introduced earlier in Chapter 3. Respondents to the Arizona Survey had the opportunity, through open-ended questions, to indicate those integrating themes or focal points that characterized their activities. Themes mentioned more than once are listed in Table 5.20.

The highest number of citations relate to the rather amorphous area of environmental "awareness" and environmental planning (read political action in the Advocacy Sector). Most of the indicated themes are strongly discipline oriented, although subthemes of pollution and litter involved 24 respondents. What is most striking is that even though it is possible that larger integrative themes are being practiced, they are not sufficiently perceived so that the respondents can name them. Of the five core themes discussed in Chapters 3 and 6, none are mentioned; although environmental unity may be implicit in several citations. Critical themes of current public concern such as economics, settlement and land use, and energy are ignored.

Arizona Environmental Education Trends

There has been substantial movement into environmental education in recent years, and the trend may be accelerating. Moreover, among those organizations which currently have environmental education activities, many expect to expand these activities relative to their other programs (Table 5.27).

To obtain insights into the direction which Arizona environmental education is likely to be headed, all respondents (including those now without environmental education programs) were asked to react to some statements dealing with the environment and environmental education. Nearly all respondents agreed with the notion that environmental education should stress equally social and natural aspects of the environment (Table 5.28). This agreement was consistent regardless of sectoral orientation. Similarly, only one in twenty believed that decisions concerning the environment should be made only by scientists and technicians. Such beliefs seem to give support to efforts to broaden traditional environmental education, and may be significant in terms of the general atmosphere in which such changes may be encouraged.

Nearly as emphatic is the extent of agreement with the statement that "most environmental problems can and should be resolved at the local or state level." Among Arizonans, at least, the attempts by "outsiders" to solve environmental problems are not likely to be popular. This does not mean that Arizonans see no role for federal support for environmental education, for there is almost as much agreement that federal support for strong environmental education programs should be forthcoming.[1] And the notion that statewide planning for increased and broadened environmental education is also strongly supported.

This section has only summarized selected results of the Arizona Survey. A follow-up analysis, which will incorporate the full array of two- and three-way matches is planned. Even at the summary level, however, the survey has provided important insights into the structure and local perceptions of environmental education in the state. These should be of value in further environmental planning and development. It is believed that this type of survey, given the adjustments suggested in Appendix D, can be useful in evaluating the circumstances of environmental education from local to regional scales.

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[1] Although funding is deemed a significant problem by many, a substantial proportion of organizations report no funding problems for their environmental activities (Table 5.29). As a corrollary to the funding question, it is interesting to note how few Arizonans are sufficiently familiar with the Environmental Education Act to have considered its use as a funding source (Table 5.30).

TABLE 5.4

CHARACTERISTICS OF THE SAMPLE

Sector	Processed	Sent Out	Percentage Return
Advocacy	105	228	46
Societal	53	122	43
Government	187	305	61
Education	252	543	46
Bubble	10	22	45
Total	607	1,220	49.8

TABLE 5.5

[1]INVOLVEMENT WITH ENVIRONMENTAL EDUCATION: PERCENTAGE RESPONSE BY SECTOR

Sector	Great Extent	Some Extent	Little Extent	Not At All
Total	14	41	17	28
Advocacy	16	36	8	40
Societal	8	40	18	34
Government	17	32	15	37
Education	11	50	23	17
Bubble	40	50	0	10

[1] Question 2: To what extent is your organization or agency involved with environmental education or activities related to environmental education such as conservation, resource management, etc.?

TABLE 5.6

APPROXIMATE PERCENTAGE OF RESPONDENTS TO DETAILED QUESTIONS ABOUT ENVIRONMENTAL EDUCATION

Sector	Total Respondents	Percentage of Total Respondents
Advocacy	105	45
Societal	53	50
Government	187	35
Education	252	75
Bubble	10	80
Total	607	55

TABLE 5.7

PERCENTAGE OF ORGANIZATIONS WITH ENVIRONMENTAL EDUCATION IN WHICH MORE THAN HALF OF ORGANIZATIONAL EFFORT IS DEVOTED TO ENVIRONMENTAL EDUCATION (N=322)[1]

Total	13	Government	18
Advocacy	25	Education	7
Societal	16	Bubble	37

[1] Question 19b: In regards to your organization's or agency's activities, about what percentage . . . of the overall organizational effort is devoted to environmental education?

TABLE 5.8

[1]INVOLVEMENT WITH ENVIRONMENTAL EDUCATION: PERCENTAGE OF TOTAL SAMPLE RESPONDING "YES"

Sector	Teaching: Formal	Teaching: Informal	Research	Creation	Program Development	Dissemination	Financial	N
Total	33	23	12	20	27	34	12	607
Advocacy	13	24	12	25	24	42	17	105
Societal	6	36	6	12	28	32	14	53
Government	10	22	10	22	21	25	16	187
Education	68	24	15	16	31	33	6	252
Bubble	0	36	20	30	40	70	20	10

[1] Question 3: Is your organization or agency involved with environmental education in any of the following ways?

TABLE 5.9

[1]DATE OF ORGANIZATION'S FIRST INVOLVEMENT IN ENVIRONMENTAL EDUCATION:

PERCENTAGES BY SECTOR AND TOTAL

Sector	Before 1900	1900-19	1920-39	1940-59	1960-67	1968-71	1972-75
Total	4	8	9	10	15	22	27
Advocacy	4	6	6	13	21	13	30
Societal	4	15	12	12	12	27	15
Government	4	19	16	9	11	17	23
Education	5	4	7	8	16	25	30
Bubble	0	0	0	25	13	25	38

[1] Question 20: When did your organization or agency first become involved with environmental education?

TABLE 5.10

[1]DISCIPLINARY RELATIONSHIPS OF ENVIRONMENTAL ACTIVITIES: PERCENTAGE RESPONDING "YES" BY SECTORS

Sector	Single	Multidisciplinary	Interdisciplinary
Total	24	45	31
Advocacy	30	44	33
Societal	25	52	20
Government	26	37	39
Education	22	48	29
Bubble	12	50	33

[1] Question 10: Are your organization's or agency's environmental activities presented in the following ways?

TABLE 5.11

[1]TYPES OF ORGANIZATIONS PROVIDING SUPPORT: PERCENTAGE RESPONDING "GREAT" OR "SOME" EXTENT BY SECTOR

Type of Organization	Total	Advocacy	Societal	Government	Education	Bubble
(a) Federal Government	50	25	35	76	47	50
(b) State Government	53	30	[illegible]3	57	61	38
(c) Local Government	33	23	[illegible]6	44	32	38
(d) Institutions of Higher Education	35	30	30	39	36	25
(e) State Department of Education	31	14	29	16	42	13
(f) County or Local School District	26	18	10	19	34	13
(g) Individual Schools	21	16	14	17	25	13
(h) Business and/or Industry	44	51	45	41	43	50
(i) Environmental or Conservation Organizations	38	45	32	37	37	38
(j) Service Organizations	24	21	33	22	23	38
(k) Philanthropic Organizations	17	16	32	10	18	25
(l) Sporting/Recreation Organizations	23	34	36	14	22	13
(m) Media Sources	31	28	26	33	32	25
(n) Private Individuals	36	68	52	33	24	63
(o) Headquarters or Branches of own Organization	30	45	59	45	17	13

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[1] Question 22: To what extent does your organization or agency receive funds, materials, or other support for environmental education from each of the following?

TABLE 5.12

[1]TYPES OF ORGANIZATIONS TO WHOM SUPPORT IS GIVEN: PERCENT RESPONDING "GREAT" OR "SOME" EXTENT BY SECTOR

Type of Organization	Total	Advocacy	Societal	Government	Education	Bubble
(a) Federal Government	23	34	8	49	9	29
(b) State Government	28	48	13	51	13	63
(c) Local Government	35	54	13	67	18	57
(d) Institutions of Higher Education	31	39	13	66	14	75
(e) State Department of Education	17	26	4	28	11	57
(f) County or Local School District	36	30	32	60	28	33
(g) Individual Schools	43	50	36	62	34	29
(h) Business and/or Industry	26	44	12	51	11	57
(i) Environmental or Conservation Organizations	36	54	38	61	18	67
(j) Service Organizations	32	47	28	58	17	43
(k) Philanthropic Organizations	9	11	8	16	6	14
(l) Sporting/Recreation Organizations	25	42	20	47	12	14
(m) Media Sources	33	58	28	55	17	57
(n) Private Individuals	37	51	48	61	22	29
(o) Headquarters or Branches of own Organization	30	45	36	57	13	29

[1] Question 25: To what extent does your organization or agency provide funds, materials, or other support for environmental education to each of the following?

TABLE 5.13

NAMES OF ORGANIZATIONS DESIGNATED AS SOURCES AND RECIPIENTS OF SUPPORT FOR ENVIRONMENTAL EDUCATION ACTIVITIES

Organizations Most Frequently Cited as Sources of Support (Number of Citations in Parenthesis)[1]	Organizations Most Frequently Cited as Recipients of Support (Number of Citations in Parenthesis)[2]
Arizona Department of Education (21)	Arizona Game and Fish (5)
Arizona Fish and Game Department (14)	Arizona State University (5)
Arizona Legislature (13)	Boy Scouts (6)
Arizona State University (8)	Colleges and Universities (13)
Bureau of Land Management (5)	"Conservation Organizations" (6)
Colleges and Universities (10)	U.S. Forest Service (6)
National Forest Service (18)	Individual Schools (21)
National Park Service (7)	Local Governments (13)
School District (9)	Local and County Schools (26)
Soil Conservation Service (5)	State Department of Education (7)
U.S. Department of Interior (10)	School Districts (9)
U.S. Department of Agriculture (3)	"Media" (7)
University of Arizona (12)	University of Arizona (7)
U.S. Office of Education (8)	Southern Arizona Environmental Council (
National Science Foundation (6)	

[1] Question 23: Name three organizations specifically from which your organization or agency receives the most support.

[2] Question 26: Name three organizations specifically to which your organization or agency provides the most support.

TABLE 5.14

ORGANIZATIONS INDICATING PROVISION OF DIRECT RESOURCE AND PERSONNEL ALLOCATION TO ENVIRONMENTAL EDUCATION GROUPS BY TYPE OF RESOURCE: PERCENTAGES BY SECTOR

	Total	Advocacy	Societal	Government	Education	Bubble
Resource Allocation:[1]						
Financial Support	14	21	33	24	6	0
Equipment Support	37	37	36	55	29	43
Material Support	51	64	54	72	36	86
Personnel Allocation:[2]						
Give In-house Lectures	62	80	79	80	46	50
Give Public Lectures	58	76	96	81	41	75
Create Materials	51	62	62	71	37	75
Give Technical Aid or Advice	59	70	60	88	44	50

[1] Question 27: Does your organization or agency allocate resources through direct funding or sponsorship to environmental education groups in the following ways?

[2] Question 28: Does your organization or agency contribute its personnel to environmental education groups in the following ways?

TABLE 5.15

EXTENT OF COORDINATION OF ENVIRONMENTAL EDUCATION ACTIVITIES BY INSTITUTION: PERCENTAGE RESPONSE

Responses of Noneducational Organizations Regarding Coordination Between Their Organization and Community (And Its Schools)[1]		Responses by Education Institutions Regarding Coordination Among . . .[2]		
		Grade or Age Levels	Schools In System	Schools And Community
Very Well Coordinated	10	10	7	6
Somewhat Well Coordinated	49	35	28	27
Not Very Well Coordinated	41	56	65	67
N =	144	N =	162	

[1] Question 16b: How well coordinated is environmental education between your organization or agency and the community and its schools?

[2] Question 15d: How well is environmental education coordinated among . . .

TABLE 5.16

[1]PRIMARY AUDIENCE FOR ENVIRONMENTAL EDUCATION ACTIVITIES: PERCENTAGE RESPONSES

	Total	Advocacy	Societal	Government	Education	Bubble
Within Own Organization	43	22	46	17	61	0
Neighborhood	3	3	4	0	4	0
Community	30	41	38	49	20	0
State	16	30	8	16	11	83
Region	2	0	4	6	1	0
Nation	6	5	0	13	3	17
World	0	0	0	0	1	0

[1] Question 14: Which *one* of the following is the primary audience for your organization's or agency's environmental education activities?

TABLE 5.17

TARGETS OF ENVIRONMENTAL EDUCATION: PERCENTAGE RESPONSES

Formal Educational Institutions[1]		Noneducational Institutions[2]	
Nursery	34	Under Five Years	20
Primary	48	6 to 12 years	51
Junior High/Middle School	54	13 to 19 years	63
High School	38	20 to 35 years	77
Junior College/Community College	11	36 to 55 years	75
Undergraduate	28	56 and Over	71
Graduate	25		
Postgraduate	12		
Adult Education	12		

[1] Question 15b: To what grade levels are your institution's environmental education activities directed?

[2] Question 16a: To what age levels are your organization's or agency's activities in environmental education directed?

TABLE 5.18

[1]ORGANIZATIONS WHICH STRESS INTERRELATIONSHIPS BETWEEN MAN & NATURE: PERCENTAGE BY SECTOR RESPONDING "GREAT" OR "SOME" EXTENT

Advocacy	82
Societal	69
Government	80
Education	83
Bubble	100

[1] Question 5: To what extent do your organization's or agency's activities concentrate on the interrelationship between man and nature?

TABLE 5.19

[1]PROGRAM ORIENTATION/EMPHASIS: PERCENTAGE RESPONDING "GREAT" OR "SOME" EXTENT BY SECTOR

	Total	Advocacy	Societal	Government	Education	Bubble
Biology/Ecology	73	67	62	69	78	62
Earth Science/ Physical Geography	66	47	36	65	78	75
Business/Commerce	34	46	24	45	26	75
Aesthetics	54	70	61	71	40	100
Urban Areas	45	70	56	59	29	50
Wilderness Areas	59	60	60	59	56	74
Agricultural Areas	48	49	32	54	47	62
Public Health	51	45	52	58	51	29
Architecture/ Engineering	29	29	20	55	17	50

[1] Question 4: To what extent does your organization or agency emphasize the following subjects in your environmental education activities?

TABLE 5.20

[1]INTEGRATING THEMES, PROBLEMS OR FOCAL POINTS FREQUENTLY CITED BY ORGANIZATIONS: FILL-IN RESPONSES

Natural/Physical Science Orientation	Number of Citations	Social/Behavioral Science Orientation	Number of Citations
Air/Water Pollution	17	Litter	7
Biology/Life Sciences	7	Environmental Planning	41
Environmental Awareness	71	Governmental	11
Geology/Mining	7	Sociological	25
Health	15	Aesthetics	7
Weather/Climate	3	Architecture	3
Physical Science	4		
Recreation/Camping	5		

[1] Question 10g: What are the principal integrating themes, problems, or focal points of study?

TABLE 5.21

[1]PROBLEM FOCUS: PERCENTAGE RESPONDING "YES" BY SECTOR

	Total	Advocacy	Societal	Government	Education	Bubble
Family	56	49	65	45	63	38
Neighborhood	73	79	71	65	76	50
Community/County	94	94	88	93	95	75
State	82	94	72	70	83	100
Region	71	75	61	62	74	88
Nation	69	61	48	56	79	50
World	54	33	50	40	66	13

[1] Question 8: Does the subject matter of your environmental education activities focus on problems encountered at the following levels?

TABLE 5.22

[1]TEACHING STRATEGIES: PERCENTAGE RESPONDING "GREAT" OR "SOME" EXTENT BY SECTOR

	Total	Advocacy	Societal	Government	Education	Bubble
Field Trips	63	54	73	47	69	63
Specific Outdoor Sites	47	15	50	55	50	25
Teaching: Problem Solving	59	40	42	51	69	50
Teaching: Information & Facts	76	78	80	64	79	88
Teaching: Simulation/Role Playing	33	23	25	26	39	13

[1] Question 7: To what extent does your organization's or agency's environmental education activities incorporate the following?

TABLE 5.23

[1]SKILL DEVELOPMENT: PERCENTAGE RESPONDING "GREAT" OR "SOME" EXTENT BY SECTOR

Sector	Technical and/ or Laboratory	Outdoor	Organization/ Communication	Environmental Field Methods
Total	38	53	39	43
Advocacy	30	43	54	37
Societal	20	52	35	36
Government	50	60	47	65
Education	39	53	29	35
Bubble	12	50	50	37

[1] Question 6: To what extent does your organization's or agency's activities develop the following environmental education skills?

TABLE 5.24

[1]AFFECTIVE ACTIVITIES: PERCENTAGE RESPONDING "GREAT" OR "SOME" EXTENT BY SECTOR

Sector	Political Involvement & Action	Specific Value Systems	Decision-Making Situations
Total	43	54	56
Advocacy	67	68	55
Societal	29	42	36
Government	47	61	63
Education	36	49	56
Bubble	62	65	75

[1] Question 9: To what extent do your organization's or agency's educational activities involve . . .

TABLE 5.25

[1]ORGANIZATIONS USING MEDIA DEVELOPED BY OTHERS: PERCENTAGE RESPONDING "YES" BY SECTOR

	Radio	T.V.	Newspapers and/or Magazines	Mailings
Total	31	37	57	48
Advocacy	36	39	56	63
Societal	42	45	52	65
Government	36	30	54	41
Education	27	38	59	46
Bubble	40	40	40	50

[1] Question 13: Does your organization or agency develop environmental education materials or make use of materials developed by other organizations for use in any of the following media?

TABLE 5.26

EDUCATION FOR CAREERS AND IN-SERVICE TRAINING: PERCENTAGE RESPONDING "YES" BY SECTOR

		In-Service Training[2]	
Sector	Education for Careers[1]	Own People	Other People
Total	49	49	31
Advocacy	21	57	48
Societal	27	65	27
Government	56	70	45
Education	58	28	20
Bubble	13	63	57

[1] Question 11: Do your organization's or agency's activities include education for careers in the environmental field?

[2] Question 12: Does your organization or agency train its own people in teaching and/or development of environmental education . . .

TABLE 5.27

[1]AGENCY ACTIVITIES WITH HIGH EMPHASIS ON ENVIRONMENTAL EDUCATION (50% OR MORE): PERCENTAGE RESPONSES

Sector	Percentage of Organizational Effort Toward Environmental Education	Percentage of Organizational Effort Toward Environmental Education in 1980
Total	13	21
Advocacy	25	32
Societal	16	25
Government	18	29
Education	7	12
Bubble	37	57

[1] Question 19: In regards to your organization's or agency's activities, about what percentage . . .

TABLE 5.28

[1]SOME ATTITUDINAL DIMENSIONS: PERCENTAGE RESPONDING "STRONGLY AGREE" & "AGREE"

	Total	Advocacy	Societal	Government	Education	Bubble
(a) Equal Stress on Social & Natural Aspects	95	93	96	96	94	89
(b) Problems Should Be Solved at Local or State Level	73	75	73	79	66	90
(c) Recent Environmental Movement Has Been Harmful	22	34	13	24	18	20
(d) Need for Federal Support	72	69	84	73	71	67
(e) Need for a State Plan	90	92	98	92	86	100
(f) Decision Making Should Be By Scientists	5	4	7	8	3	10

[1] Question 29: Following are some statements that people have made about environment and environmental education. Remembering that you represent your organization's point of view . . . do you strongly agree, agree, disagree or strongly disagree with the following?

a. Environmental education should stress equally the social (socio-economic and political) aspects as well as the natural (physical and biological) aspects of the environment.

b. Most environmental problems can and should be resolved at the local or state level.

c. In general, the recent environmental "movement" has been harmful for the country.

d. The Federal Government should support in all possible ways the development of an integrated national program in environmental education.

e. Each state should develop a plan to include environmental education at all levels.

f. Decisions concerning environmental problems should be made only by scientists and technicians.

TABLE 5.29

[1]PROBLEM WITH FUNDING: PERCENTAGE RESPONSES

Sector	Major	Minor	None
Total	40	36	24
Advocacy	37	39	24
Societal	46	32	23
Government	43	35	22
Education	40	36	24
Bubble	17	50	33

[1] Question 24: How much of a problem is funding for your organization's or agency's environmental education activities?

TABLE 5.30

[1]FAMILIARITY WITH ENVIRONMENTAL EDUCATION ACT: PERCENTAGE RESPONSES

Sector	Very Familiar	Somewhat Familiar	Not At All Familiar
Total	5	49	46
Advocacy	6	46	49
Societal	2	42	56
Government	5	46	49
Education	5	54	42
Bubble	13	50	38

[1] Question 1: How familiar are you with the Environmental Education Act of 1970?

CHAPTER 6

ENVIRONMENTAL EDUCATION: RETROSPECT AND OVERVIEW

Introduction

This chapter is intended to amplify the discussion presented in Chapter 3 with a more detailed analysis of the "core themes" of environmental education. It includes the description of a specific schematic model which is used to interpret a selected sample of 132 programs of higher education. These programs, in turn, are assumed to be generative and heuristic in that they function as training programs for future environmental education activities and concepts for elementary, secondary, higher education and technical and professional personnel in both public and private sectors. The data and conclusions presented herein are the result of generalized analysis based upon the written descriptions provided by the institutions themselves and, as such, remain as assessments of the perceptions of these institutions rather than an in-depth, long term analysis. It is emphasized, however, that a number of these locations were visited by project staff and others acting as consultants for this project.

The model used for assessment is described in detail specifically as it relates to the criteria set forth by the Environmental Protection Agency guidelines for environmental studies (Cook, 1974) and those set forth in Chapter 3 (Figure 3.2 and Figure 6.1) above. This assessment establishes quantitative systems-level criteria for the three domains of environmental education (natural, human, and technological), and suggests an information flow (general system) analysis. By using an inclusive concept of this type,

FIGURE 6.1 SYSTEM MATRIX

	Traditional View	Ekistics View	PL 91-516
Techno Systems	**Technical** Materials and techniques; mechanical, physical, chemical tools; organized systems of tools and processes; extraction/production/construction, etc.	**Shelters** Housing, community facilities, city centers **Networks** Public utility systems, water, power, sewerage Transportation systems, road, air, rail Communication systems, computer and information systems, physical lay-out (plan)	Pollution Resource Allocation Technology Transportation Urban and rural planning
Human Systems	**Psycho Social** Interpersonal relations, individual and collective behavior patterns **Social Institutions** Kinship, religious, political, economic, recreative, cultural, educational	**The Individual** (Man) Physiological needs, safety and security, affection, belonging, esteem, self realization, knowledge and aesthetics **Society** Public administration and the law, social relations, population trends, cultural patterns, social hierarchy, economic development, health and welfare	Population Economic Impact
Natural Systems	**Environmental** **Atmospheric**-air, water, radiation, energy and gas cycles **Lithospheric**-plant and animal organic population-mineral cycles **Hydrospheric**-plant and animal organic population-water cycles	**Nature** Climate, water, soil, plants, animals, geology, topography, environmental analysis, resources, land use	Conservation Resource Depletion

FR: "Environmental education activities . . . demand as well that the tools of the various disciplines be used in a highly integrative manner."

FR: "Emphasis shall be placed on the development of skills and insights needed to understand the structure, requirements, and impact within and among various environmental entities, systems and subsystems."

FR: "The intent of the process is to 'involve participants in inquiries into both the specific and general environmental implications of human activities and their short and long range effect on societal resources and general public policy.'"

FR: "Each environmental education activity partakes of particular aspects of these areas (disciplines, institutions, environmental concepts and problems), fusing them in a manner that makes a greater comprehension and understanding of contemporary environmental issues and problems possible by bringing about deeper awareness of relevant interrelationships . . ."

Integration
Synthesis
Holism,
etc.

FR: "The areas (environmental inquiry) themselves are separately defined for the sake of convenience only; in reality, they are all interconnected. It is this interwoven quality and the balances and relationships among areas that environmental education deals with."

Law: "The term 'environmental education' means the educational process dealing with man's relationship with his natural and manmade surroundings, and includes the relation of population, pollution, resource allocation and depletion, conservation, transportation, technology, economic impact, and urban and rural planning to the total human environment."

NOTE: "FR" indicates Federal Register, Volume 39, Number 21, 30 January 1974; "Law" indicates PL 91-516.

the full spectrum of components of environmental education is known, leading to a better understanding of environmental unity and therefore of man's place in the universe. These variable systems of information integration, as assessed by the model, are discussed in relation to their creation of environmental perceptions and personal values which may be designated world views.

The Need for and Development of Core Themes

Environmental education encompasses a wide variety of traditional disciplines, many of which contribute invaluable specialized knowledge and methods of investigation. However, at this time, there is not a truly unified or integrated approach to environmental education nor a conceptual structure that is widely accepted. The development of such an approach and structure conflicts to a certain extent with traditional and established disciplines, each which has developed, over a long period of time, relatively rigid perimeters and research methodologies. The model presented herein illustrates this problem, inherent to the structuring of crossdisciplinary subject matter, and points out that the development of a unified environmental education framework provides a means to treat the subject across disciplines and at various hierarchical scales and levels.

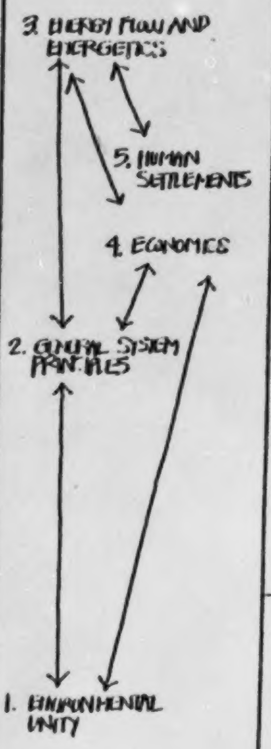
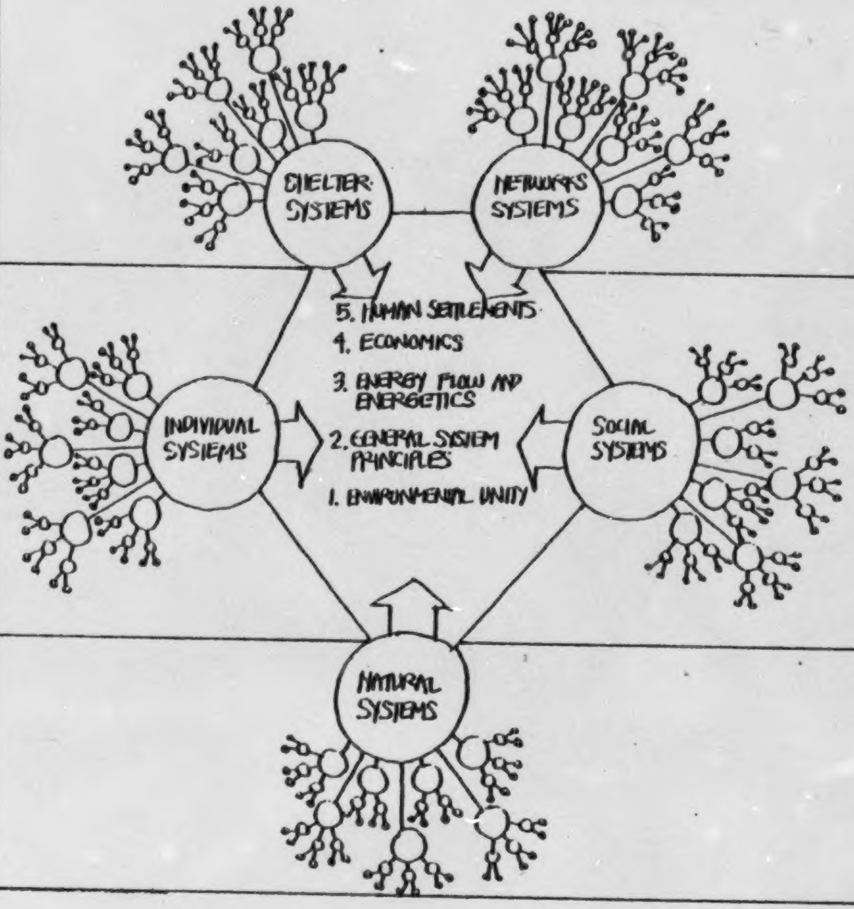
The results of the body of this work (e.g., Chapters 4 and 5) indicate similar trends toward restraints in the direction of integration or "getting it all together" in post-secondary education. As stated in Chapter 4, the programs tend to be multidisciplinary rather than interdisciplinary--emphasizing parallelism and complimentarity among the disciplines rather than integration. Similarly, many programs are not man-centered, preferring to define problems and their solutions in largely physical, natural, or technological terms, to the general neglect of the role of man, his attitudes, and institutions. While it appears necessary for integrated core themes for environmental education to be established and promoted that are adaptable to the spectrum of institutional systems within the United States, it also appears necessary that the institution at least, in part, reciprocate by adopting institutional structures so that environmental education has a better opportunity to take root and hold. Further, the model reveals the role which a specific program activity plays in the overall environmental picture as well as isolating those important aspects of environmental education to which few existing programs or activities are addressing themselves.

Karl Popper (1959) has stated that science advances not by proofs but by disproofs: by destroying the structures that it has previously erected symbolically, and progressively eliminating the unknown. Due to the nature of evolving systems, new and uniquely synthetic concepts and principles constantly arise. Enormous changes are wrought upon our world views and our resulting re-structuring of education due to the inclusion of new principles of the art and science of human affairs. Ideas which attempt to establish common themes, basic principles, and unifying threads, or which focus concept and experience for all disciplines, may be unique to our time. New languages such as general system principles, process-energy flow, and others, have begun to challenge cash flow as the universal integrating language.

Figure 6.2 illustrates core themes of new concepts and principles which have affected the perceptions of decision-makers regarding their environmental world views, ranked in a hierarchy of inclusion. Figure 6.2 is an extension

FIGURE 6.2

CORE THEMES FOR ENVIRONMENTAL EDUCATION

	Core Themes (See Full Descriptions Chapter 3)	Ekistics View	PL 91-516	SYSTEM MODEL
Techno Systems	 3. ENERGY FLOW AND ENERGETICS 5. HUMAN SETTLEMENTS 4. ECONOMICS 2. GENERAL SYSTEM PRINCIPLES 1. ENVIRONMENTAL UNITY	**Shelters** Housing, community facilities, city centers **Networks** Public utility systems, water, power, sewerage Transportation systems, road, air, rail Communication systems, computer and information systems, physical lay-out (plan)	Pollution Resource allocation Technology Transportation Urban and rural planning	 SHELTER SYSTEMS NETWORKS SYSTEMS 5. HUMAN SETTLEMENTS 4. ECONOMICS 3. ENERGY FLOW AND ENERGETICS INDIVIDUAL SYSTEMS 2. GENERAL SYSTEM PRINCIPLES SOCIAL SYSTEMS 1. ENVIRONMENTAL UNITY NATURAL SYSTEMS
Human Systems		**The Individual** (Man) Physiological needs, safety and security, affection, belonging, esteem, self realization, knowledge and aesthetics **Society** Public administration and the law, social relations, population trends, cultural patterns, social hierarchy, economic development, health and welfare	Population Economic impact	
Natural Systems		**Nature** Climate, water, soil, plants, animals, geology, topography, environmental analysis, resources, land use	Conservation Resource depletion	

Law: "The term 'environmental education' means the educational process dealing with man's relationship with his natural and manmade surroundings, and includes the relation of population, pollution, resource allocation and depletion, conservation, transportation, technology, economic impact, and urban and rural planning to the total human environment."

of Figure 6.1 (Figure 3.2 in Chapter 3), and it is useful to briefly review the explanation of Figure 3.2 (page 3.18) in Chapter 3. Three vertical columns--the three-level categorization of systems, the ekistical view, and the excerpts from PL 91-516--have been retained in Figure 6.2, as has the horizontal column describing environmental education. Two new cross-related elements have been added: (1) core themes (replacing the traditional view), and (2) an inclusive schematic model which incorporates all of the above.

Core Themes Content Examples

Derived from these new systemic integrators (which primarily consist of dynamic hierarchic flow processes described in Chapter 3) are general system concepts which foster such themes as the excellent environmental education core for (college, high school and MDTA) pest management programs. Such themes stress fully integrated environmental education (overlapping natural-systems, human-systems, techno-systems) and since basic human values are included, are uniquely holistic in approach. These programs and processes differ markedly from the potpourri environmental program models in that they appear to stress both quantitative (span or breadth) issues and qualitative (depth of values) issues. Coverage of understanding deals fully and equally with values, content and context of: (1) information interlinked among disciplinary "specializations," (2) methods of implementation of goals, and (3) the timing of feedback and adjustments which allow for correction of previous errors.

Conceptually-based programs such as that of John Muir Institute for Environmental Studies, Inc., include core themes in the form of an environmental studies concepts hierarchy, an analysis and problem-solving skills hierarchy, and an environmental studies affective objectives hierarchy.

Among currently active programs, there is a trend to connect information sources to minimize concept redundancy; allow communication and information tools to be utilized by those who are interested; attempt to refrain from the use of bureaucratic and over-structured systems of control; try to bring academics at all levels in touch with the general citizen. Strong examples exist at the Resource Science Center at the University of British Columbia, the Institute of General Systems Research at California Polytechnic, Pomona, California, and the Environmental Education Center and the Systems Science Institute at Portland State University, Oregon. Additionally, the suggested use of these approaches is reported by Jantsch (1970) in a paper "Inter- and Transdisciplinary University: A Systems Approach to Education and Innovation." He stressed the normative goals (or values) in institutions of education where:

> Ultimately the entire education/innovation system may become coordinated as a multilevel multigoal hierarchical system through a transdisciplinary approach, implying generalized axiomatics and mutual enhancement of disciplinary epistemology. (Jantsch, 1970)

In short, continuous self-renewal implies increased capability for educational curricula or institutions to meet the challenges placed before them by such citizen-aware people as Phyl Smith, who in reporting the need for citizen learning at the 1974 Spokane Conference on the environment, has said that "the educators need to eliminate the mass confusion in academia and to demonstrate by example that they know what they are talking about." And by definition, this activity implies cross-fertilization and generalization of scientific concepts into a common language framework, which provides for the integration of new wisdom to be shared with the people. It implies a new structure, seen initially by disciplinary mutations (bio-physics, psycho-history, eco-psychology, eco-philosophy, cybernetics, system science, energetics, etc.), but which preserves the existing intellectual potency of a highly differentiated, disciplinary system. The common language demands, in addition to the existing formal hierarchies, flexibility and an ability to recurringly hybridize disciplines. This new structure is the organic hierarchy.

If the common language connections among disciplines (including age levels, education levels, etc.) are made at levels of either logical homology or isomorphism, it is clear that the core ideas will vary in kind or in language rigor, but that the structural aspects and respective laws, principles, or symbols may be identical. They may, perhaps, even promote agreement toward common social goals. Implied here is the concept of synergy, where the union of two or more disciplines provides for a result more interesting than the parts alone. The "togetherness" that is exhibited by core themes is revealed in the literature as well as in existing and developing educational activities. Selected examples which have originated in technological, human, or natural sub-systems of environment are presented in the following sections.

Technosystems

In technosystems, integrative thinking has emphasized process/place oneness. This is illustrated in Ekistics, An Introduction to the Science of Human Settlements (Doxiadis, 1968), The Guide for the Development of an Interdisciplinary Environmental Education Curriculum: Ekistics (Riles, 1973), for the California State Department of Education, The Urban Organism (Havlick, 1974), and the more general "Access to Cities for Teachers: Curriculum-Proof Kids Through Environmental Studies," (Cotton, 1973). Other treatments of integrative processes include both "Systems Management," (Johnson, et al., 1964), and general cybernetics (Wiener, 1950).

More recently, however, the work of E. F. Schumacher (1974) has integrated variable economic development of cultures with appropriate technology. In environmental education, this is important because the methodology is available in non-technical language. Dynamic modeling of urban and world growth by Technologists Forrester and Meadows (1972) has encouraged integrated decision-making in environmental affairs; feedback-loop dynamics, the concept of steady state, and carrying capacity are significant foundations of the approach. Additional support for environmental wholeness comes from Richard Meier's A Communication Theory of Urban Growth as well as Christopher Alexander (1964), who has been heavily committed to creating a theoretical framework for agreement of psychic wholeness with the environment.

These attempts to integrate are numerous; but those which attempt to integrate such processes as general system theory, self-design process, cybernetics, synergetics, anticipatory design, driving functions, energetics and general urban ecosystems are rare. Among the few examples are Towards a General Theory of Planning Design (Peterson, et al., 1972). More network oriented are the media ventures Ecology and the Human Environment (radio: American University, Washington, D.C.); the media referendum The Bend in the River Council (television: Rabbs and Kesey, 1974); and The Land and Me (television: State of Maine P.B.S.). Each is intended to fully develop citizen participation in an integrated environmental education format.

Human Systems

Comprehensive "non-disciplinary" approaches to the study of man abound, but they are usually generated by individuals operating from a disciplinary, humanistic or social sciences base. More recently, emphasis has been placed on group (interdisciplinary) efforts to systematically study and explain human behavioral principles. Futurists and human ecologists have been prominent in these regards. Among the few programs addressing these issues are the Southern Colorado State College (Kahn, 1972), general ecology of knowledge programs such as the Center for Interdisciplinary Creativity at Southern Connecticut State College (Clark, 1972), and the proposed graduate program in Social Sciences at the University of Pennsylvania (Ackoff, 1973).

Natural Systems

It can be argued that practically any ecological or geographical course or program in the natural sciences area is satisfying needs to describe and explain the natural systems component of the environment. It is literally impossible to either agree or disagree with this position without assessing every teacher, every course, and every program in the United States. Certainly such efforts as the BSCS Green Book, or many ecology texts and courses, provide essential conceptual background for study of natural systems. Nevertheless, expansion of the traditional curriculum in this area would provide greater insights and understanding of the _full_ natural environment. The integration of core themes is quite effective in these cases. For example, infusion of ecological principles and economics is well represented by _Ecology and the Economy: A Concept for Balancing Long Range Goals_ (Pacific Northwest River Basins Commission, Bishop, et al., 1974). Meldings of ecology and energetics are characterized by the _Carrying Capacity Project for Florida and its Major Regions Involving Natural Systems Inventory and Comprehensive Planning_ (Kylstra, ed., 1974), and most of Howard T. Odum's work at the Center for Wetlands in Florida. The above programs are, at the same time, capable of common specialty compartmentalization and the utilization of new and evolving languages held in common.

Connecting the Techno-Human-Natural Levels

Programs and activities which attempt to vertically integrate the three domains of environmental education (natural-systems, human-systems and techno-systems) are rare because they must alleviate the difficulties of language differentiation, lack of inter-agency cooperation, common citizen-intellectual schisms, etc., and attempt to respond to the following needs:

> Since the public domain in ecological terms, is a unified natural system of sub-systems, the concept of arbitrary administrative jurisdictions which divide and separate the public domain is at odds with its needs for continuity and integrity. (Lawrence I. Hewes, Jr., Former Chief of Economics and Statistics of the Outdoor Recreation and Resources Review Commission)
>
> The task of America today is the prosaic one of arranging our public institutions so that they can manage our collective environmental needs. (Michael Brenner, NATO Fellow, Natural Environment Research Council, London, 1974)

These approaches by necessity demand analysis of environmental quality, such as those of Dansereau (1974), and conceptual processes which border on the integrated wisdom of mysticism and intuition. Such study and innovation will require heavily infused values statements by heretofore "objective" scientists, such as those contained in "Ecosystems, Societies, and Cities" (Marquis, 1968); "Geography in an Urban Age" (Association of American Geographers, 1969); Living in the Environment: Concepts, Problems and Alternatives (Miller, 1975); Energy, Ecology and Economics (Odum, 1973);

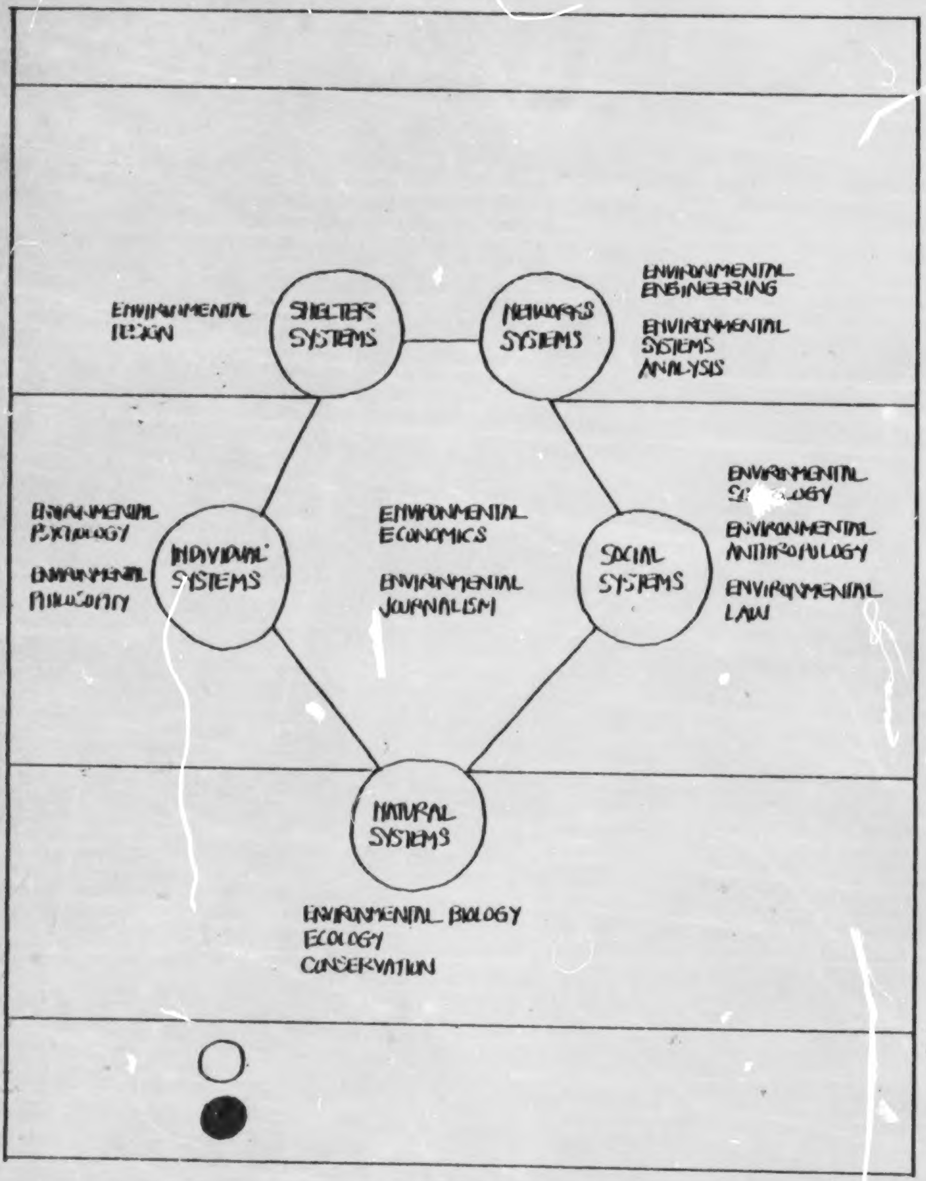
and Transition: A Report to the Oregon Energy Council (Office of Energy Research and Planning, State of Oregon, 1975).

More specifically, these core themes and other systems of inclusiveness can be analyzed in respect to the following survey and assessment of 132 programs of environmental education and environmental studies at the higher education level. This data was derived from written descriptions of their own programs and visitations to selected locations—primarily selected from the Xerox Directory of Environmental Education (1974).

The survey is summarized in Figures 6.3A - 6.3C. The figures simultaneously represent different dimensions of the environmental scene. The classification of natural, human, and technological systems is presented in three horizontal columns, while the pentagon of interconnected circles represent the ekistically-stated cornerstones of the larger man/nature network (derived from Figure 6.1 and 6.2). Discipline-related examples of fields which occur at the dimensional intersections are also provided. It is here that systematic analysis can be confused by the semantic differences inherent in descriptors of environmental education curricula and objectives (see discussion, page 2.2). By interpreting the national data base for higher education discussed in Chapter 4 and the information from 132 programs representing 39 states (Figures 6.3A - 6.3C), four conclusions are reached.

1. Only 25 of the 132 programs appeared to fit the notion of "fully balanced" or "integrated" environmental education; that is, each included major content and concept emphasis from all three levels and all five circles. Unfortunately, the actual number of these programs that are truly and fully integrated is probably less than 25. The survey data is based, in large part, on self-perceived analyses on the part of the institutions; in-depth

FIGURE 6.3A


ENVIRONMENTAL DESIGN
SHELTER SYSTEMS
NETWORKS SYSTEMS
ENVIRONMENTAL ENGINEERING
ENVIRONMENTAL SYSTEMS ANALYSIS
ENVIRONMENTAL PSYCHOLOGY
ENVIRONMENTAL PHILOSOPHY
INDIVIDUAL SYSTEMS
ENVIRONMENTAL ECONOMICS
ENVIRONMENTAL JOURNALISM
SOCIAL SYSTEMS
ENVIRONMENTAL SOCIOLOGY
ENVIRONMENTAL ANTHROPOLOGY
ENVIRONMENTAL LAW
NATURAL SYSTEMS
ENVIRONMENTAL BIOLOGY
ECOLOGY
CONSERVATION
○
●

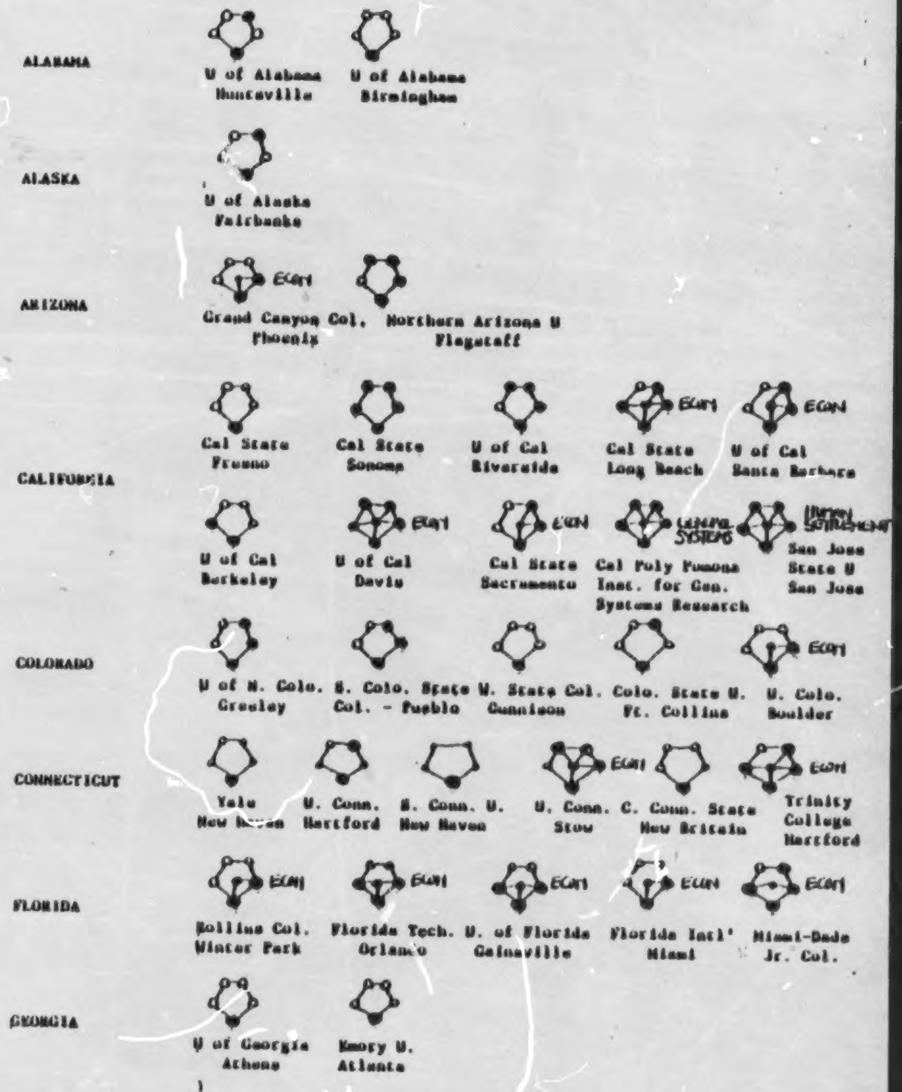

ALABAMA
U of Alabama Huntsville
U of Alabama Birmingham
ALASKA
U of Alaska Fairbanks
ARIZONA
ECON
Grand Canyon Col. Phoenix
Northern Arizona U Flagstaff
CALIFORNIA
Cal State Fresno
Cal State Sonoma
U of Cal Riverside
ECON
Cal State Long Beach
ECON
U of Cal Santa Barbara
U of Cal Berkeley
ECON
U of Cal Davis
ECON
Cal State Sacramento
GENERAL SYSTEMS
Cal Poly Pomona Inst. for Gen. Systems Research
HUMAN SETTLEMENT
San Jose State U San Jose
COLORADO
U of N. Colo. Greeley
S. Colo. State Col. - Pueblo
W. State Col. Gunnison
Colo. State U. Ft. Collins
ECON
U. Colo. Boulder
CONNECTICUT
Yale New Haven
U. Conn. Hartford
S. Conn. U. New Haven
ECON
U. Conn. Stow
C. Conn. State New Britain
ECON
Trinity College Hartford
FLORIDA
ECON
Rollins Col. Winter Park
ECON
Florida Tech. Orlando
ECON
U. of Florida Gainsville
ECON
Florida Intl' Miami
ECON
Miami-Dade Jr. Col.
GEORGIA
U of Georgia Athens
Emory U. Atlanta

FIGURE 6.3B

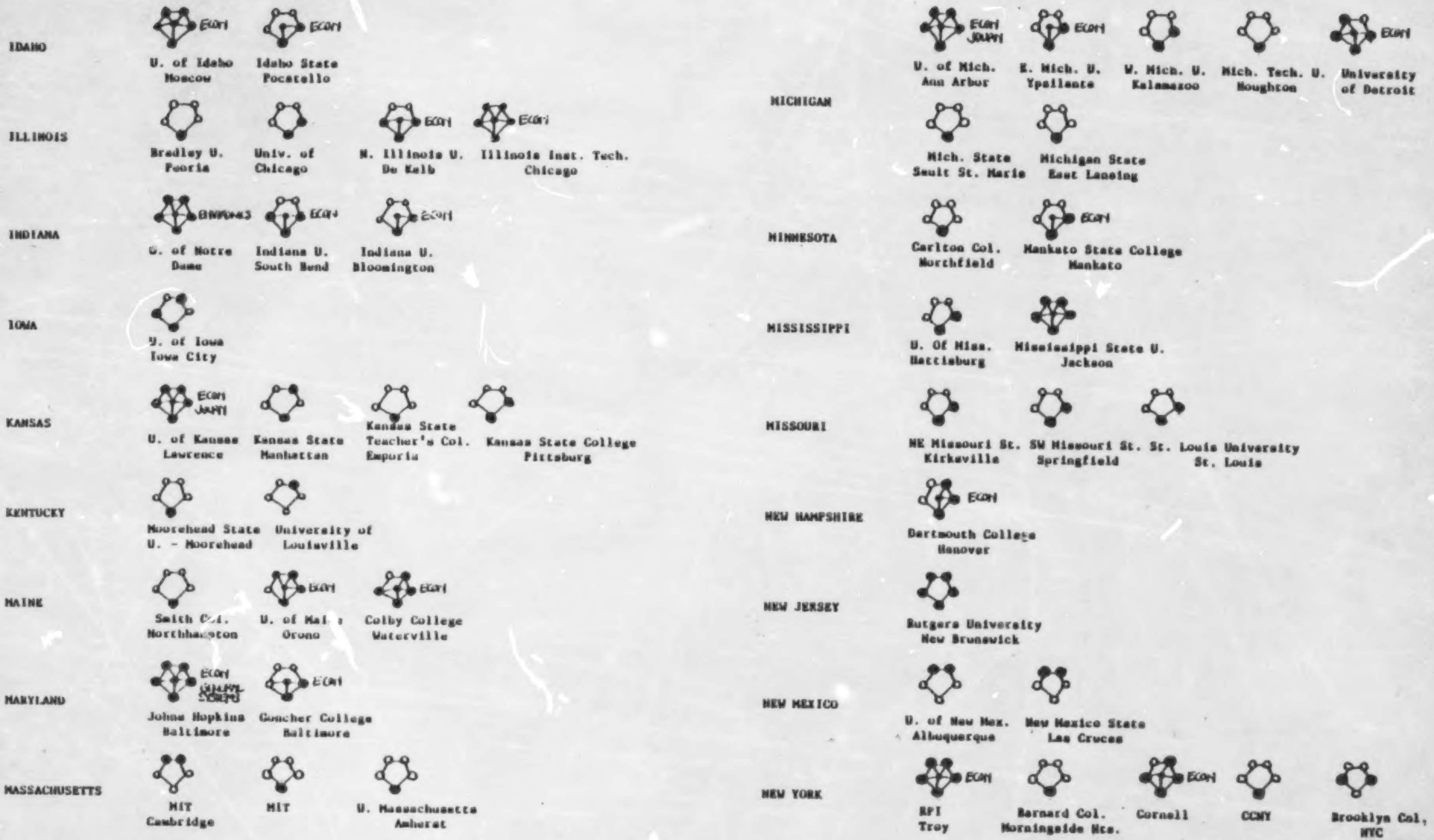
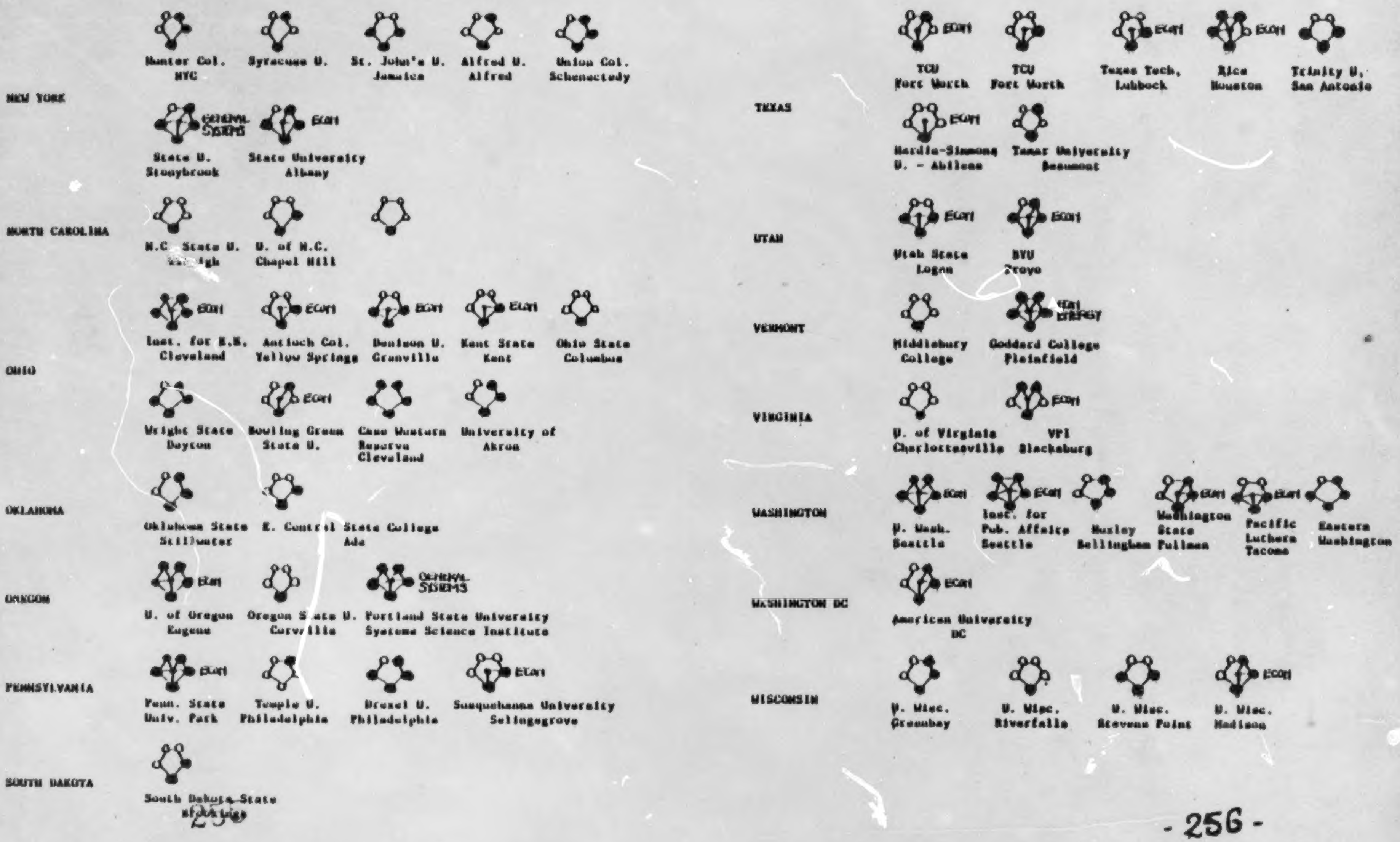

IDAHO
ECON
U. of Idaho
Moscow
ECON
Idaho State
Pocatello
ILLINOIS
Bradley U.
Peoria
Univ. of
Chicago
ECON
N. Illinois U.
De Kalb
ECON
Illinois Inst. Tech.
Chicago
INDIANA
BUSINESS
U. of Notre
Dame
ECON
Indiana U.
South Bend
ECON
Indiana U.
Bloomington
IOWA
U. of Iowa
Iowa City
KANSAS
ECON
JOURN
U. of Kansas
Lawrence
Kansas State
Manhattan
Kansas State
Teacher's Col.
Emporia
Kansas State College
Pittsburg
KENTUCKY
Moorehead State
U. - Moorehead
University of
Louisville
MAINE
Smith Col.
Northhampton
ECON
U. of Maine
Orono
ECON
Colby College
Waterville
MARYLAND
ECON
Johns Hopkins
Baltimore
ECON
Goucher College
Baltimore
MASSACHUSETTS
MIT
Cambridge
MIT
U. Massachusetts
Amherst
MICHIGAN
ECON
JOURN
U. of Mich.
Ann Arbor
ECON
E. Mich. U.
Ypsilante
W. Mich. U.
Kalamazoo
Mich. Tech. U.
Houghton
ECON
University
of Detroit
Mich. State
Sault St. Marie
Michigan State
East Lansing
MINNESOTA
Carlton Col.
Northfield
ECON
Mankato State College
Mankato
MISSISSIPPI
U. Of Miss.
Hattiesburg
Mississippi State U.
Jackson
MISSOURI
NE Missouri St.
Kirksville
SW Missouri St.
Springfield
St. Louis University
St. Louis
NEW HAMPSHIRE
ECON
Dartmouth College
Hanover
NEW JERSEY
Rutgers University
New Brunswick
NEW MEXICO
U. of New Mex.
Albuquerque
New Mexico State
Las Cruces
NEW YORK
ECON
RPI
Troy
Barnard Col.
Morningside Hts.
ECON
Cornell
CCNY
Brooklyn Col,
NYC

FIGURE 6.3C


NEW YORK
Hunter Col. NYC
Syracuse U.
St. John's U. Jamaica
Alfred U. Alfred
Union Col. Schenectady
GENERAL SYSTEMS
State U. Stonybrook
ECON
State University Albany
NORTH CAROLINA
N.C. State U. Raleigh
U. of N.C. Chapel Hill
OHIO
ECON
Inst. for E.K. Cleveland
ECON
Antioch Col. Yellow Springs
ECON
Denison U. Granville
ECON
Kent State Kent
Ohio State Columbus
Wright State Dayton
ECON
Bowling Green State U.
Case Western Reserve Cleveland
University of Akron
OKLAHOMA
Oklahoma State Stillwater
E. Central State College Ada
OREGON
ECON
U. of Oregon Eugene
Oregon State U. Corvallis
GENERAL SYSTEMS
Portland State University Systems Science Institute
PENNSYLVANIA
ECON
Penn. State Univ. Park
Temple U. Philadelphia
Drexel U. Philadelphia
ECON
Susquehanna University Selinsgrove
SOUTH DAKOTA
South Dakota State Brookings
TEXAS
ECON
TCU Fort Worth
TCU Fort Worth
ECON
Texas Tech, Lubbock
ECON
Rice Houston
Trinity U, San Antonio
ECON
Hardin-Simmons U. - Abilene
Lamar University Beaumont
UTAH
ECON
Utah State Logan
ECON
BYU Provo
VERMONT
Middlebury College
ECON ENERGY
Goddard College Plainfield
VIRGINIA
U. of Virginia Charlottesville
ECON
VPI Blacksburg
WASHINGTON
ECON
U. Wash. Seattle
ECON
Inst. for Pub. Affairs Seattle
Huxley Bellingham
ECON
Washington State Pullman
ECON
Pacific Luthern Tacoma
Eastern Washington
WASHINGTON DC
ECON
American University DC
WISCONSIN
U. Wisc. Greenbay
U. Wisc. Riverfalls
U. Wisc. Stevens Point
ECON
U. Wisc. Madison

project assessments of some of the institutions indicated that in some cases their publicity is better than their execution.

2. Of the themes identified, economics was clearly the most prominent. While economics has been historically uninvolved in environmental education (Chapter 3), it does appear that economists, once into the game, have a great impact.

3. Human systems treating both the individual and society are more influenced in environmental education by such fields as political science and sociology than by those which focus on the individual, such as philosophy, medicine, or psychology.

4. With a few excellent exceptions, participation in fully balanced environmental education programs by the design sciences (architecture, planning, and engineering) have been significantly low.

Finally, it should be noted that the earth and natural sciences continue to dominate and probably lead the way in environmental education. The social and behavioral sciences lag behind, but are catching up; design and technology sciences continue to postpone their responsibility in this area. Further examination of the figures (6.3A - 6.3C) provide additional information, but it must be recognized that this data base is most effectively used to discern trends rather than provide the final word on each of 132 institutions of higher learning.

Integrated Learning Models for Core Themes

Learning models which attempt to integrate knowledge, attitudes, values, and performance are needed if core themes are to be effectively implemented.

Most of the learning models assessed emphasized cognitive learning and varied from integrated programs and activities to those which only emphasize the concepts and principles of ecology (natural systems). Other programs are developing environmental education curricula which emphasize the interrelated concepts from both the natural sciences (natural systems) and the social sciences (human systems). A fine example of this has been developed by the University of Wisconsin Environmental Education Branch of the Wisconsin Research and Development Center for Cognitive Learning (Jeter, et al., 1974). The program utilizes the concept learning and development (CLD) model (Klausmeier, Ghatala and Frayer, 1974), which "prescribes one means of flexibly organizing the central ideas or concepts chosen by curriculum developers into a hierarchy, reflecting the various levels of inclusiveness of the concepts chosen; the subject matter, thus organized, can then be attacked systematically, working either upwards or downwards through the hierarchy, successively broadening or narrowing the scope of the material presented to the students." This process attempts to provide a truly integrated interdisciplinary environmental education curriculum for the elementary school through high school.

While extremely well done, the above model does not appear to directly account for the integration of the concepts and issues of the urban environment or technological knowledge (techno-systems). The John Muir Institute for Environmental Studies (JMI) Urban Experimental Environmental Studies Curriculum Project is an example of a program which attempts to fully integrate not only the physical and biological sciences (natural-systems), but also the social, economic, historical and philosophical (human-systems) problems. It is based upon generalizable concepts, skills, and attitudes utilizing concept hierarchies for a comprehensive kindergarten-high school design. This process places concepts in an instructional sequence utilizing a concept hierarchy chart which is intended, in turn, to facilitate curriculum development, the orientation of students and teachers, and comparison and assessment of different environmental education programs.

At the state level, the Maryland approach to environmental education provides an interdisciplinary curricular framework for kindergarten through twelfth grade. Covering all the three domains of knowledge (natural-systems; human-systems; techno-systems) in an integrated fashion, this approach appears to meet the goals and criteria of a multi-leveled, hierarchically ordered, "fully balanced," inclusive environmental education process. Through the use of indicators of acceptable performance, ranked in three levels, the framework organization encourages expansion and understanding in a developmental and dynamic series of concepts, tasks and experiences.

While all of the above programs are excellent, their approaches attempt primarily to "steer" the learner through pathways designed to help the student "blossom" through the inclusion of certain conceptual frames of experience. This appears to be a result of a call for values-reorientation and cultural change. If so, it poses many new questions for the traditional environmental educator, who has dealt primarily with ecology (natural-systems) and only minimally with man's values relationships to and with nature.

Personal Restructuring to the Core Themes

As John Dewey has stated:

> Educators must be ready to modify methods and policies in the light of new knowledge and changes in the environment . . . in other words, education enables us to interpret the flux of experience (both tangible and imagined), so that we may understand it with greater clarity and in truer perspective. At the same time, increased knowledge and awareness of past experience enable us to guide future experience more adequately.

> Instead of merely drifting with the tide of events we steer our own course. Growth through the reconstruction of experience is thus both the nature and goal of education itself (Dewey, 1917).

If this defined hierarchically inclusive re-organization has a single thesis, it may simply be that an individual's organization, balance, and clarity of perception and awareness at any point in time is a direct result of his patterning of events into meaning-wholes. Hence, it is largely by strengthening and/or rebuilding these organizing structures that the processing of new information is facilitated. This process of acquisition evolves as a result of using and periodically rebuilding organizing structures that appear to have the widest explanatory power and inclusiveness in understanding the environment. These operations (on the environment), Piaget (1957) has designated as organized bodies of schemata (building blocks of the intellect) which are formed and reformed through the continued and dynamic existence of the individual. He says that:

> Operational schemata are thus thought of as actualized structures, implying the diverse possibilities implicit in the structured whole, that is to say, in the form of equilibrium of the propositional operations. Mathematical combinatorial operations are formed systematically from the first, whenever the situation or problem demands it; since the subject, when he coordinates experiential data and especially when he selects out of all the possible propositional operations those which fit this particular arrangement of data, is concerned with an implicit combinatorial system. This combinatorial system implied by the lattice of propositional operations is therefore derived by abstraction from the operational constructions intuitively arrived at by the subject (Piaget, 1957).

Piaget (1947) further states that:

> Each of the transitions from one of these levels to the next is therefore characterized both by a new coordination and by a differentiation of the systems constituting the unit of the preceding level.

In general, the relatively recent emergence of the concept of structure and system concerns new and rejuvenated principles of explanation in all the sciences: concern for wholes, relationships, interactions, codes of rules, transformations, constraints, self-regulation, morphogenesis, goal-seeking—all involving some conception of infrastructure, deep structure, primary system or primary process. Rudolf Arnheim (1969) also refers to these as themata which he says are:

> The perceptual shape of the underlying principles of scientific conceptions, as referred to by Harvard physicist Gerald Holton. He refers to thought models that derive neither from empirical statements, such as meter readings, nor from analytical ones, reliant on the calculus of logic or mathematics. Holton does not wish to commit himself as to whether these themata should be associated with any of the following conception: Platonic, Keplerian, or Jungian archetypes or images; myths (in the nonderogatory sense, so rarely used in the English language); synthetic a priori knowledge; intuitive apprehension or Galilei's "reason;" a realistic or absolutistic or, for that matter, any other philosophy of science (Arnheim, 1969).

While these relational phenomena appear to evolve broad common agreement among a variety of disciplines, there does not seem to be sufficient recognition of the larger need for implementation at a transdisciplinary level. Turning once again to the Environmental Education Act and its interpretations, it can be seen that both internal developmental processes as well as external developmental processes need to be addressed to resolve both the "problem" of learning and the "problem" of proceeding as a society toward a condition of productive harmony with our tangible (natural and man-made) environment. As stated in the interpretations of the Environmental Education Act (Federal Register 30 January 1974), learning processes involving "environmental education activities should teach, in addition, one or both of the following processes of problem solving:

The Intellectual	The Practical
Problem-solving that must be learned as a part of the general intellectual discipline required to master relevant methodologies and information and to synthesize them as they are brought to bear on particular environmental issues.	Problem-solving that deals with actual environmental, social, and economic factors that must be considered and weighed if rational solutions to environmental problems are being sought.

In environmental education activities, problem-solving is emphasized as a process, taught in such a way that it is transferable to other environmental problems and helpful in gaining insight into a variety of environmental phenomena."

This interpretation clearly defines that acceptable environmental education must cover both internal and external learning situations and attempt to continuously erase the boundaries between cloistered knowledge and its "real-world" applicability. Strong integrations of theory and practice are suggested here and areas such as career education, training for careers, proprietary education, and new university-community interdisciplinary communication is implied. Where transferability is suggested, it has appeared to be most effective in such programs as The Mobile Center for the Study of the Environment at the University of Wisconsin, Green Bay, which focuses upon back doorstep problems in urban communities and community-high school-university integration. The latter exchanges academic knowledge of environmental improvement for "real-world" environmental situations and events. This type of program is not particularly crisis-oriented and as such appears to have greater "staying power." As indicated in Chapter 4, there is evidence that many programs are crisis-oriented, and to the extent that this is true, do not equip students to anticipate environmental problems or to act as long-range planners. The Green Bay type of program defines values, attitude change, behavior, performance, and "place" change as valid integrated experiences, and includes assessments of interactions not normally accounted for; that is, outside the classroom. For the general case, values and attitude change (internal problem-solving) are highly regarded, whereas their direct implications (external problem-solving) for behavior, performance, and "place" are slighted. Very few programs, for example, contain any mention of careers or career training in the tangible natural and man-made environments. In an article entitled "Environmental Problems and the Scientist," which stresses these same problems, Batisse (1973) integrates the psychological environment with the territorial or external (urban) environment and concludes by suggesting that beyond the internal and external development synthesis, what is needed is "at least one other dimension . . . namely that of systems or levels of organization."

This internal-external relationship to problem solving has also been uniquely defined by Skinner (1971) who defines these developmental (world view) stages (internal) in terms of their (external) environmental contingencies. While this a structuralism, it is not a pure developmentalism.

> A pure developmentalism, contenting itself with patterns of sequential change in structure, misses the chance to explain behavior in terms of genetic or environmental histories. It also misses the chance to change the order in which stages succeed one another or the speed with which changes occur. A developing culture may pass through a sequence of stages as the contingencies 'develop' but we can change the contingencies through intentional design (Skinner, 1971).

It is precisely this connection between the world view or values development and the tangible environment that must be emphasized in order to perceive the total interrelationship that man has with his urban-technological and rural-natural environments and their direct and immediate impact on our own systems. It is impossible to consider the attributes of outdoor environment-based education without awareness of the mental and classroom constructs by which the societal and educational processes work.

On the other hand, consideration must be given to those concentrated environmental education processes which move from the external environment to the internal environment, such as Vietnam, television, films, and Earth Day which influence the whole culture and work to affect the entire field of education and especially environmental education. Media events such as the Spokane Environmental Film, the Biological Sciences Curriculum Study Films, the Communications Research Films, the popular movies Soylent Green and WestWorld, the Land and Me Television Series (Maine), the Man and His Environment Films (Florida), and the Bend-in-the-River Media Referendum (Oregon), all deal inclusively with interdisciplinary integration and environmental information. However, only the Oregon program was participatory and inclusive of citizen participation and feedback.

The contexts of each of these media environmental education events affect perceptions, and if we may assume that cultural world views

(Weltanschauung) are shifting rapidly at this point in regard to differing perceptions (molded, in part, by education), then only by in-depth examination of these can we assess the validity of maintaining diversity in environmental education. For example, the values elaborated in the recent book by Miller (1975), establish a potentially dialectic model for basic disagreement, as does the National Environmental Policy Act and the Environmental Education Act--unless the dynamics of changing perceptions are taken into account.

Environmental World Views

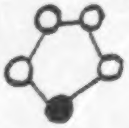
As pointed out clearly by Hallowell (1951), the cultural factors influencing the organization of perceptions (internal) and the manner in which sense data (external) are integrated with the practical experience of the individual, produces effective adaptations in a particular environment. This is a major fact of interest to environmental education.

> Experience tells us that no ecological issue lacks for vested interests and differing opinions. A solution that satisfies one group may have serious social, economic, and even aesthetic repercussions for another. Such factors as culture, perception, and education strongly influence our attitudes; it's the old dilemma that one man's meat is another man's poison (Marcus, 1973).

Varying perceptual world views such as those recently reported in "Ecophilosophy and Ecopolitics: Thinking and Acting in Response to the Threats of Eco-Catastrophe" (Kvaloy, 1974), portend major cultural conflict regarding environmental policy, issues and educational structure at the world scale.

In other words, there is a continuum of behavior from the individual through various critical groupings that impact on the decision making and actions practical at all hierarchal scales. This was earlier expressed, in part, by the "values criteria" of the Chapter 3 situation model (page 3.11). The following pages attempt to look at the larger perspective by definition of five environmental world views existing in contemporary cultures.

World View One:[1] Natural Environmental Unity, Internal Subjective Emphasis, Natural Systems Emphasis



The essence of World View One is that nature (or natural systems) subsumes man and his activities within an undifferentiated system where part and whole are factors that are irreducible. Irreducibility is one of the classic descriptors of reality in philosophy. The similarities of the whole/part may be perceived as (1) an acceptance of integration in the primitive case (such as an infant's world view), or (2) a rediscovery of wholeness by operatives in a fragmented world (e.g., retreat from disciplinary bases). Simplification and integration predominate, and "environmental" education is seen as consciousness change to an integrated state. While this world view does not immediately appear to have high relevance for environmental education, it might be noted that this perception has appeared as "getting back to" the earth, "returning" to the basics, "flight" to the wilderness, and other highly symbolic metaphors for leading an integrated life. Additionally, Piaget (1954, 1964) and others have discussed at length some of these basic characteristics which may also apply to the environmental education paradigm used here.

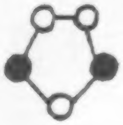
Other characteristics of this perceptual world view may be found in the underlying philosophies behind the originally formulated goal norms of the Sierra Club, the Audubon Society, the National Wildlife Federation, the

---

[1] Note that these world views may be symbolically expressed in the same terms shown in Figures 6.2 and 6.3A.

Nature Conservancy, Outward Bound, and most all of the "nature" centers and "wilderness" camps (see earlier discussions in Chapter 2). In a more structured learning environment this world view takes the form of learning the basic life processes, "getting the feet wet," and "getting the organism back into its environment," as if the urban environment was not "nature" or "environment" at all, and the primeval wetlands or swamp were the "natural" habitat of man. See World View Three for the developed consequences of the advanced state of this perception.

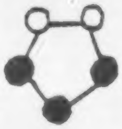
World View Two: Two-Part Environmental Differentiation, External Objective Emphasis, Human/Cultural Systems Emphasis



In this world view almost all ecological or environmental issues boil down to direct dialectics between the individual and the larger group in a classic descriptor of duality. This dualistic model relies upon a highly differentiated, objective, and analytic emphasis. It contains decomposable systems where the interdependent parts function *as if* they were interdependent of each other. Segmented, partial, and exclusive perceptual modes towards language, environmental education, and objective science predominate. Competition, winning and losing sides, and formal hierarchic models of organizational structure dominate--in which case, environmental issues and solutions are seen in terms of conflict and/or control.

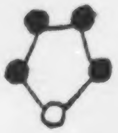
This is the management paradigm, the realm of (pre-collective bargaining) attorneys. Separation and segregation of entities is viewed as a benefit toward "purity" and "rigor." Fundamentally defined by this paradigm is of course the minimization of synergy, segregation by definition, and conquest and external reality-based models such as those in Henderson's (1973) article, "Ecologists versus Economists." As such, this paradigm of environmental perception fully misconstrues the premises underlying the Environmental Education Act and its interpretations in that its primary concern deals mostly with human domain issues, to the mutual exclusion of factors from the natural systems and the urban or techno-systems domain which become subjugated by the will and power and fears of human thought and activity. Skinner (1971) and May (1969) also stress the existence of the separation between the social processes and the tangible environment, which tend to reinforce the processes of narrow topical insulation of thought and feeling. There are perplexities inherent in the resolution of these schisms and dualities. It may be found that the ethics of individual choice, democratic determination, and "free" enterprise which comprise the foundations of American society are *at times* by nature antithetical to the centralized decision making and control implied, for example, by community-wide or nation-wide health or environmental programs.

World View Three: Three-Part Environmental Integration,
Internal Subjective Emphasis, Human/
Cultural and Natural Systems Emphasized



In World View Three there is a conscious attempt to integrate man with nature in the most basic ways and remove the thinly disguised dichotomy (World View Two) that ignores this fundamental integration and forces a choice between man and natural systems. Focus on natural systems and *reintegration* of the social sciences *in relation to* the natural sciences causes mutant forms of information and conceptualization (such as the transformation of animal psychology to ethology). In more immediate terms, environmental education is viewed as "crisis-oriented" behavior focused on immediate events and short-term solutions. Focus on long-term, long-range, integrated policy/place development is minimal, while problem-focused emphases begin to restructure those sectors of knowledge formerly differentiated into short-lived "task forces" of multidiscipline complexion. Partisan groups for "saving the whales" operate within semiformal, hierarchy structures. Nongovernmental organizations take the form of Copernican Internationalism (Taylor, 1971), utilizing the coercive powers of World View Two to mediate between such man/nature integrations as population dynamics and resources of nature.

World View Four: Four-Part Environmental Differentiation, External Objective Emphasis, Technological Systems and Human Systems Dominate



This world view is strongly manifested by the majority of industrially "product"-ive leaders. As an almost archetypal model of inductive fragmentation, the parts (disciplines, departments, bureaus, municipal governments, individuals, corporations, etc.) tend to operate independently from each other without cohesion or concept of the whole. Here, the shared ideological paradigm of such institutions contributes to knowledge obtainable primarily through the analytic decomposition of complex systems into simplistic parts. Strong notions of efficiency, quantifiable growth, environmental simplicity, and exponential processes are fortified by a structurally rigid "formal" hierarchic structure guaranteed to segregate and compartmentalize knowledge.

These highly differentiated structures also rely heavily upon structural authority, guaranteeing that interactions among subsystems remain weak and nearly decomposable. Loss of synergy, "community," and cohesion mark this pervasive world view. Energies are primarily devoted to the tools and technologies viewed necessary to achieve the (externally measured) "good life" concerned with short-run successes. This techno-level paradigm can be discussed as progressive segregation, or progressive mechanization, behavior of elements in isolation, high language differentiation, high intellectual verbalization, and viewing the world as a machine and the natural systems as mining of resources potentials. While nature as a resource bank was originally perceived as Manifest Destiny (see Chapter 2), this type of perception leads directly to the ultimate extrapolation of technology and tools far removed from the natural systems from which they emanate; e.g., nuclear weapons, electronic simulations, and the visions of advanced medical technology.

World View Five: Five-Part Environmental Integration/Differentiation, Internal and Subjective/External and Objective Emphasis, Variable Systems Integration

In order to cope with and transcend the inherent fragmentation and highly differentiated purposeful systems of World View Four, in World View Five there is an attempt to integrate the technological, the humanistic, and the ecological "imperatives." World View Five begins as a complex system of systems, and matures to the level of attempting to make its wealth available to all parts of the whole system. Marks of this integrative thrust are knowledgeable and aware citizens, unrestricted flow of information, nonprofit corporations, common sense, and processes which generate long-term, creative, harmonious solutions for the community (techno, human, and natural) at large. This world view--sometimes called the "second naivete" (Maslow, 1968; Buber, 1950), "the world system and human values" (Burhoe, 1971), or the "suitable gestalt"--has its basis in the underlying positive primary conception of integrated "oneness," or nondecomposable systems.

Heaven and earth and I
are of the same root,
the 10,000 things and
I are of one substance.

-Tao Te Ching

All material objects,
different as they appear
to be, are built out of
the same fundamental particles and forces. All
living creatures - microbes,
plants, animals, and man -
derive a fundamental unity
from their common origin.

-Rene Dubos
A God Within

Once these total interrelationships are identified and accepted, the world looks different to the observer. Antagonisms disappear and are replaced by compensatory actions (corrective and anticipatory). For example, rather than focusing on competitive, social and political viewpoints, states and nations might cooperate in an overall environmental policy--such as apply to oceans, the atmosphere, and energy. In short, life takes precedence over death. Here, the issues change context: a new model emerges in the human domain, utilizing technological systems to realign man and his systems in harmony with the world.

Examples of principles of this world view are internalizing externalties, semilattice interrelations, and organic hierarchies, which address quality of life. There is emphasis upon intuition, spontaneity, and creative positive acts within an anticipatory set of solutions. World View Five has strong impact on the existing major systems operating in World View Four because, as present cultural systems are constituted, knowledge, relationships, organizations, and cities are categorized into highly specialized parts of subsets. For the forseeable future (while restructuring may take place), the whole system world view must take advantage of available foci by including as many subsets as possible--without falling into the trap of information overload. To do this, each discipline must generate more highly generalized position statements at every level, so that instead of mountains of data among subsets at the methods level for example, information is contextually interrelated.

It cannot be emphasized too strongly that the restraining influence is primarily structural, and that minor mutation of the constraining structure can both sustain the existing "system" while increasing those activities which ultimately may prove to be the basis for a quantum world view leap. It is in this world view that evolution from states of simplicity to states of complexity are desired. Here, the self-regulatory capability of systems are encouraged to assert themselves and categories ("professional" - "nonprofessional") begin to submerge themselves. Restructuring of partitioned knowledge is encouraged and anticipatory preventive solutions are generated and acted upon by interdisciplinary (soldier-citizen; citizen-scholar; teacher-student; Canadian-American, etc., etc.) teams.

For purposes of this report, it is important that the interrelationships between the content and intent of environmental education and that of the world views be recognized. In many respects, the core themes and integrative and synthetic mandates of environmental education distill the process and structures required by World View Five. But because environmental education can be organized and function at a less cosmic scale, it provides a means to infuse integrative teaching and learning throughout a system that still remains somewhat fragmented.

APPENDIX A

TEEP FORM

(Types of Environmental Education Programs)

7.2

TEEP

I. TYPE: Level by Origin

1. School District__________
2. Intra-State Region_______
3. State Level______________
4. Federal__________________________
5. College & Univ.____________________
6. Commercial Publishers_____________
7. Misc. _____________

II. TYPE DESCRIPTION

1. Name of program or project____
2. Address____
____
3. Title of Unit____
4. Key Personnel____
5. Dates beginning operation: Pre-1965_____ 1965-69________ 1970-Now________
6. Grade Level (circle appropriate numbers)
Stated: K 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Teacher Ed. Graduate Adult
Judged: K 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Teacher Ed. Graduate Adult
7. Teacher's Guide: Yes__________ No______________

III. SCALE

1. Target Population

Schools: Elementary___________ Secondary______________ K-12____________

Teachers_______________________

Community Groups_______________

Special Groups:

a. Ethnic_____________________
b. Mentally Handicapped________
c. Physically Handicapped______
d. Other (specify)_____________

2. Geographic Patterns

	Extent of Program	Problem Focus
World		
National		
Regional		
State		
Local		
N/A		

IV. Content and Methodology:

1. Disciplines
   - a. Inter__________
   - b. Multi__________
   - c. Conservation______________
   - d. Ecology__________________
   - e. Single (list)______________

2. Aspects of Environmental problems stressed (more than one can be checked)
   - a. Social__________
   - b. Economic________
   - c. Biological______
   - d. Chemical__________________
   - e. Physical__________________
   - f. Geographical______________
   - g. Political____________

3. Man/Environment (Does the program described concern involvement of man within the system?)
   - a. totally________ b. partially______ c. none_________

4. Skill Development (techniques)
   - a. Technical (lab, outdoor)____________________________
   - b. Communicative_____________________________________
   - c. Human relations___________________________________
   - d. Camping____
   - e. Problem solving___________________________________

5. Pedagogy: more than one can be checked
   - a. Lecture/text_______________
   - b. Inquiry/problem solving____
   - c. Additional insights________
   - d. Evaluation of Alternatives__
   - e. Computer Assisted Instruction____
   - f. Games/simulations_______________
   - g. Camping__________________________
   - h. Outdoor activity________________

6. Stated objectives:
   - a. Informational_______________
   - b. Camping/recreation__________
   - c. Skills__________________________
   - d. Change (values, attitudes, behavior)________________________

IV. CONTENT AND METHODOLOGY, CONTINUED

7. Outdoor orientation:

a. Field trips: Urban____ Industry____ Rural____ Wilderness____
b. Problem location: Urban____ Industry____ Rural____ Wilderness____
c. Sites: Nature Trail___ Nature Center___ Outdoor Lab___ Other___
d. Mobile units____
e. Camping____

V. TRANSFERABILITY AND IMPLEMENTATION

a. Implementation: Cost (if given)________________________________
Equipment requirements: Science kits_______ VTR______
Outdoor labs______ Indoor labs_____ Records, tapes_____
Slides, films, filmstrips_____________ Journals, newspapers___________
Transportation________ Opaque________ Texts______________
Schoolroom_________ Homes____________ Park_______________
Camp_____________ Maps____________ Articles_______________
Corp. handouts___________ Pamphlets__________ Case studies___________
Simulation games________________ Other___________________________
Comments:____
____
____

b. Transferability:
Transferable_________ Transferable but must adapt______________________
Not transferable________________

VI. CAREER ORIENTATION

a. Does this program have careers education______ Education for Careers_____
or neither?____________________
b. Grade levels____________________
c. Depth: Mention_______________ discuss_______________________
Counseling____________ training (incl. skills)_____________
Total orientation of program___________________________
d. Specific job titles_____________________
____
____

APPENDIX B

TEEP FORM FOR NONSCHOOL BASED SURVEY

NONSCHOOL-BASED TEEP FORM

Organization Name: ______________________________

ENVIRONMENTAL EDUCATION ACTIVITIES:

A. Publications/Materials Disseminated: ______________________________

B. Workshops/Conferences/Seminars Sponsored: ______________________________

C. Funding Efforts (Scholarships/Research, etc.) ______________________________

D. Other: ______________________________

D. Other: (Con't)

SUBJECT MATTER ORIENTATION:

A. Natural Science (Biology, Nature, Geology, etc.):

OR

B. Social Science (Meaning Inclusion of Man) and Natural Science:

OR

C. Social and Natural Science Including A Citizen Action Phase:

D. Skill Developments:

E. Outdoor Education:

F. Pedagogy:

G. Stated Objectives:

OTHER:

A. Target Population:

1. Age:

2. Location:

B. Transferability and Implementation:

C. Career Orientation:

APPENDIX C

SURVEY QUESTIONNAIRE FOR ENVIRONMENTAL EDUCATION

ID ________

ARIZONA STATE UNIVERSITY

3/75 CENTER FOR ENVIRONMENTAL STUDIES

ENVIRONMENTAL EDUCATION SURVEY

Conducted by

ENVIRONMENT-BASED EDUCATION PROJECT
ARIZONA STATE UNIVERSITY

NOTE: All replies will be treated anonymously. The results of the survey will be used only when combined with those of many other organizations or agencies.

OFFICE USE ONLY
ID# ________ 1-5
____
____

(Circle one answer code number for each question unless otherwise instructed.)

1. How familiar are you with the Environmental Education Act of 1970?

Very familiar 1 6
Somewhat familiar 2
Not at all familiar . . . 3

So that all respondents will treat the questions about "Environmental Education" in the same way, the following definition should be used throughout the questionnaire.

> "Environmental education is that education which aims to develop:
>
> (a) Basic awareness of the environment.
>
> (b) Fundamental understanding of processes by which persons are both affected and sustained by the environment, and
>
> (c) An appreciation of the interrelationships between society, economics, politics, and nature in the use and management of environment (or any part thereof)."

2. To what extent is your organization or agency involved with environmental education or activities related to environmental education such as conservation, resource management, etc.?

Great extent 1 7
Some extent 2
Little extent 3
Not at all (*Skip to Q.29*) 4

3. Is your organization or agency involved with environmental education in any of the following ways?

	Yes	No	
a. Teaching in a formal educational institution?	1	2	8
b. Teaching other than in formal educational institutions? . . .	1	2	9
c. Research in environmental education?	1	2	10
d. Creation of environmental materials and/or products? . . .	1	2	11
e. Development of programs in environmental education?	1	2	12
f. Dissemination of environmental education materials and/or programs?	1	2	13
g. Provide financial or other contributions?	1	2	14

If Q.3a through "g" are all "No," skip to Q. 29. If only "Q.3g" is "Yes," skip to Q.25.)

Following are some questions about the activities of your organization or agency in environmental education.

4. To what extent does your organization or agency emphasize the following subjects in your environmental education activities?
(Circle one code number on each line)

	Great extent	Some extent	Little extent	Not at all	
a. Biology/Ecology	1	2	3	4	15
b. Earth Science/Physical Geography	1	2	3	4	16
c. Business/Commerce	1	2	3	4	17
d. Aesthetics	1	2	3	4	18
e. Urban areas	1	2	3	4	19
f. Wilderness areas	1	2	3	4	20
g. Agricultural areas	1	2	3	4	21
h. Public health	1	2	3	4	22
i. Architecture/Engineering	1	2	3	4	23

	Great extent	Some extent	Little extent	Not at all	
5. To what extent do your organization's or agency's activities concentrate on the interrelationship between man and nature?	1	2	3	4	24

6. To what extent does your organization's or agency's activities develop the following environmental educational skills?
(Circle one answer code number on each line)

	Great extent	Some extent	Little extent	Not at all	
a. Technical and/or laboratory skills	1	2	3	4	25
b. Outdoor and/or recreational skills	1	2	3	4	26
c. Skills in environmental organization and/or communication	1	2	3	4	27
d. Activities dealing with environment field methods	1	2	3	4	28

7. To what extent does your organization's or agency's environmental education activities incorporate the following?
(Circle one answer code number on each line)

	Great extent	Some extent	Little extent	Not at all	
a. Field trips	1	2	3	4	29
b. Specific outdoor sites such as nature centers, camps, zoos, parks, etc.	1	2	3	4	30
c. Teaching through problem solving . .	1	2	3	4	31
d. Teaching through information and facts	1	2	3	4	32
e. Teaching through simulation and/or role playing	1	2	3	4	33

8. Does the subject matter of your environmental education activities focus on problems encountered at the following levels?

	Yes	No	
a. Family?	1	2	34
b. Neighborhood? . . .	1	2	35
c. Community or county?	1	2	36
d. State?	1	2	37
e. Region?	1	2	38
f. Nation?	1	2	39
g. World?	1	2	40

9. To what extent do your organization's or agency's educational activities involve . .
(Circle one answer code number on each line)

	Great extent	Some extent	Little extent	Not at all	
a. an emphasis on political involvement and action?	1	2	3	4	41
b. the promotion of specific value systems in environmental education or management?	1	2	3	4	42
c. the use of decision making situations and/or determination of values?	1	2	3	4	43

10. Are your organization's or agency's environmental activities presented in the following ways?

a. A single discipline or speciality?

Yes 1 44

No *(Skip to Q.10c)* . . . 2

(If Yes)

b. What discipline or speciality? ________________________________ 45,46

c. Multidisciplinary methods, that is, several specialities presented separately?

Yes *(Skip to Q.10e)* . . . 1 47

No *(Skip to Q.10d)* . . . 2

d. Interdisciplinary methods, that is, several specialities team taught or interwoven?

Yes *(Skip to Q.10e)* . . . 1 48

No *(Skip to Q.11)* . . . 2

(If Yes)

e. What specialities?	f. What is the estimated percentage?	
(1) ____________________	____%	49—52
(2) ____________________	____%	53—56
(3) ____________________	____%	57—60
(4) ____________________	____%	61—64
	Total 100%	

g. What are the principal integrating themes, problems, or focal points of study?

____ 65,66

____ 67,68

____ 69,70

1. Do your organization's or agency's activities include education for careers in the environmental field?

Yes	1	71
No	2	

2. Does your organization or agency train its own people in teaching and/or development of environmental education . . .

	Yes	No	
a. for internal purposes within your organization or agency?	1	2	72
b. for people outside your organization or agency?	1	2	73

ext are some questions about the use of media for environmental education.

3. Does your organization or agency develop environmental education materials or make use of materials developed by other organizations for use in any of the following media?

	(1)Materials Developed By Your Organization		(2)Materials Developed By Others		
	Yes	No	Yes	No	
a. Radio?	1	2	1	2	74–75
b. TV?	1	2	1	2	76–77
c. Newspapers and/or magazines? . . .	1	2	1	2	78–79 80/1 1–5/DUP
d. Mailings?	1	2	1	2	6–7

ext are some questions about the target audience to which your organization's or agency's environmental education is directed.

4. Which one of the following is the primary audience for your organization's or agency's environmental education activities?

Within your own organization or agency?	1	8
Your neighborhood?	2	
Your community or county?	3	
Your state?	4	
Your region?	5	
Nation?	6	
World?	7	

15a. Is your organization or agency a formal educational institution?

Yes 1 9
No *(Skip to Q.16a)* . . . 2

(If Yes)

b. To what grade levels are your institution's environmental education activities directed? *(Circle all that apply)*

Nursery/pre-school/kindergarten 1 10
Primary school 2 11
Junior or middle school 3 12
High school 4 13
Junior college, two-year college or community college 5 14
Four year college or university 6 15
Graduate school 7 16
Post graduate work 8 17
Formal adult education 9 18

c. Does your institution have environment-related student clubs such as Ecology Clubs, Biology Clubs, etc.?

Yes 1 19
No 2

d. How well is environmental education coordinated among . . .
(Circle one code number on each line)

	Very well coordinated	Somewhat well coordinated	Not very well coordinated	
(1) grade or age levels?	1	2	3	20
(2) schools in your system?	1	2	3	21
(3) your schools and the community? . .	1	2	3	22

(Now skip to Q.17a)

6a. To what age levels are your organization's or agency's activities in environmental education directed? *(Circle all that apply)*

5 years or less	1	23
6 - 12	2	24
13 - 19	3	25
20 - 35	4	26
36 - 55	5	27
56 or older	6	28

b. How well coordinated is environmental education between your organization or agency and the community and its schools?

Very well coordinated	1	29
Somewhat well coordinated	2	
Not at all coordinated	3	

Books and programs used in your organization's or agency's environmental education are the text topics to be covered.

17a. Does your organization or agency use any nationally based programs such as BSCP, ESCP, HSGP or similar national programs in educational activities?

Yes	1	30
No *(Skip to Q.18a)* . . .	2	

(If Yes)

b. What programs?

(1) ______________________ 31,32

(2) ______________________ 33,34

(3) ______________________ 35,36

8a. Does your organization or agency use any textbooks or textbook series in your environmental education programs?

Yes	1	37
No *(Skip to Q.19)* . . .	2	

(If Yes)

b. What titles? c. What author(s)?

(1) ______________________ ______________________ 38—40

(2) ______________________ ______________________ 41—43

(3) ______________________ ______________________ 44—46

(4) ______________________ ______________________ 47—49

(5) ______________________ ______________________ 50—52

(6) ______________________ ______________________ 53—55

Next, we cover your organization's or agency's degree of involvement in environmental education and interaction with other groups.

19. In regards to your organization's or agency's activities, about what percentage . . . *(Circle one code number on each line)*

	Less than 20%	29% -49%	50% -79%	80% or more	
a. of environmental education materials and programs are developed within the organization?	1	2	3	4	56
b. of the overall organizational effort is devoted to environmental education? . .	1	2	3	4	57
c. of the organization's effort do you expect will be devoted to environmental education in 1980?	1	2	3	4	58

20. When did your organization or agency first become involved with environmental education?

Before 1900	1	59
1900 - 1919	2	
1920 - 1939	3	
1940 - 1959	4	
1960 - 1967	5	
1968 - 1971	6	
1972 - 1975	7	

21a. Does your organization or agency belong to any environment or conservation oriented organization(s)?

Yes *(Skip to Q.21b)* . . 1 60

No *(Skip to Q.22)* . . 2

(If Yes)

b. What organization(s)?

(a) ______________________________ 61,62

(b) ______________________________ 63,64

(c) ______________________________ 65,66

(d) ______________________________ 67,68

In this section we will first cover the sources from which your organization or agency receives support for its environmental education programs.

22. To what extent does your organization or agency receive funds, materials, or other support for environmental education from each of the following? *(Circle one code number on each line)*

	Great extent	Some extent	Not at all	
a. Federal government	1	2	3	69
b. State government	1	2	3	70
c. Local government	1	2	3	71
d. Institutions of higher education	1	2	3	72
e. State departments of education	1	2	3	73
f. County or local school districts	1	2	3	74
g. Individual schools	1	2	3	75
h. Business and/or industry	1	2	3	76
i. Environmental and/or conservation organizations	1	2	3	77 78
j. Service organizations	1	2	3	79 80/2
k. Philanthropic organizations	1	2	3	1-5/DUP
l. Sporting and recreational organizations .	1	2	3	6
m. Media sources	1	2	3	7
n. Private individuals	1	2	3	8
o. Headquarters or branches (divisions) of your organization	1	2	3	9

23. Name three organizations specifically from which your organization or agency receives the most support. *(Please list in order of importance)*

a. ______________________________ 10–12

b. ______________________________ 13–15

c. ______________________________ 16–18

24. How much of a problem is funding for your organization's or agency's environmental education activities?

Major problem 1 19

Minor problem 2

No problem at all 3

In contrast to receiving support, this section covers the support your organization or agency provides others.

25. To what extent does your organization or agency provide funds, materials, or other support for environmental education to each of the following? *(Circle one answer code number on each line)*

	Great extent	Some extent	Not at all	
a. Federal government	1	2	3	20
b. State government	1	2	3	21
c. Local government	1	2	3	22
d. Institutions of higher education	1	2	3	23
e. State departments of education	1	2	3	24
f. County or local school districts	1	2	3	25
g. Individual schools	1	2	3	26
h. Business and/or industry	1	2	3	27
i. Environmental and/or conservation organizations	1	2	3	28
j. Service organizations	1	2	3	29
k. Philanthropic organizations	1	2	3	30
l. Sporting and recreational organizations	1	2	3	31
m. Media sources	1	2	3	32
n. Private individuals	1	2	3	33
o. Headquarters or branches (divisions) of your organization	1	2	3	34

26. Name three organizations specifically to which your organization or agency provides the most support. *(Please list in order of importance)*

a. ____________________ 35-37

b. ____________________ 38-40

c. ____________________ 41-43

27. Does your organization or agency allocate resources through direct funding or sponsorship to environmental education groups in the following ways?

	Yes, on regular basis	Yes, on an irregular basis	No, not at all	
a. Financial contributions	1	2	3	44
b. Provide equipment or facilities . .	1	2	3	45
c. Disseminate materials	1	2	3	46

28. Does your organization or agency contribute its personnel to environmental education groups in the following ways?

	Yes, on regular basis	Yes, on an irregular basis	No, not at all	
a. Give in-house lectures and/or seminars	1	2	3	47
b. Give public lectures and/or seminars	1	2	3	48
c. Create or produce environment education materials	1	2	3	49
d. Give technical aid or advice	1	2	3	50

29. Following are some statements that people have made about environment and environmental education. Remembering that you represent your organization's point of view, . . . do you strongly agree, agree, disagree or strongly disagree with the following?

	Strongly agree	Agree	Disagree	Strongly disagree	
a. Environmental education should stress equally the social (socio-economic and political) aspects as well as the natural (physical and biological) aspects of the environment	1	2	3	4	51
b. Most environmental problems can and should be resolved at the local or state level	1	2	3	4	52
c. In general, the recent environmental "movement" has been harmful for the country	1	2	3	4	53
d. The Federal Government should support in all possible ways the development of an integrated national program in environmental education	1	2	3	4	54
e. Each state should develop a plan to include environmental education at all levels	1	2	3	4	55
f. Decisions concerning environmental problems should be made only by scientists and technicians	1	2	3	4	56

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Year	57
Month	58,59
Date	60,61
Interviewer	62,63
Type Interview	64
County	65,66
City	67—69
A Subsector	70
S Subsector	71
G Subsector	72
E Subsector	73
B Subsector	74
Scale I	75,76
Scale II	77,78
9	79
Deck #	80

APPENDIX D

POST-PILOT SURVEY ON THE SURVEY QUESTIONNAIRE

APPENDIX D

POST-PILOT SURVEY COMMENTS ON THE SURVEY QUESTIONNAIRE

Generally speaking, the survey questionnaire accomplished the objective of gathering basic data and identifying trends for environmental activities. The return rate was high (750 out of 1,220 at the date of this writing) and only a few respondents saw fit to make comments about the questionnaire. These were split evenly between compliments and complaints—which is not a bad record for pilot instruments of this type. The details of the construction, testing, and implementation of the questionnaire for the Arizona pilot study are detailed in Volume II, Chapter 10.

As with any questionnaire problems arose; some were of a mechanical or typographical error, some were more substantive in relation to questionnaire logic and construction. These problems and some suggested alterations of the questionnaire are presented below.

Copy Corrections

To Question 4 add "4j. Social Sciences."

In the headings for Question 19 change "29%" to "20%."

Implementation

It is believed that the questionnaire can be used at a variety of scales, although the user may wish to make specific changes to fit local conditions. Also, users may wish to add or delete questions for their own purposes.

A major problem in the implementation of the Arizona survey was time. Because of project deadlines, only a few weeks were available in which the questionnaire could be mailed, filled in, returned, and coded. Follow-up phone calls did help bring in additional responses.

The phone calls also revealed that a number of respondents did not accurately read the questionnaire. These were organizations that responded "not at all" to Question 2 (regarding involvement in environmental education). At that point, the questionnaire requires a skip to the value questions 29a-f. The respondents independently decided that, because they were not involved in environmental education, they did not need to return the questionnaire. This problem could have been partially alleviated if a paragraph had been included in the covering letter which reinforced our need for a full census--one which included those organizations that are not involved in environmental education.

For future use, it is also recommended that two separate questionnaires be used; (1) a survey of formal educational institutions (K-university), and (2) an instrument for nonschool organizations such as government, advocating, and socializing sectors. The basic format and questions would remain, but this would eliminate problems for people who seem unable to correctly skip instructions. Also, by eliminating "skipped" sections, it would alleviate the present image of length.

Problem Areas

Question 10. As they have for the environmental field generally, semantics created problems in the questionnaire. Even with a short definition included in the questions, respondents seem to possess a variety of definitions and perceptions of "multidisciplinary" and "interdisciplinary." Question 10, which explores the methodological and specialty bases of programs, caused more difficulty than any other in the questionnaire. The responses to 10e (what specialties?) were often vague or ambiguous; 10e should probably be rewritten "what disciplines?" More importantly, Question 10 should provide an opportunity to respond positively to all three possible approaches--single discipline, multidiscipline, and interdiscipline--since some organizations (e.g., colleges) may incorporate all three methods.

The responses to Question 10g were frequently confused. We believe this is because people do not hold common definitions of terms such as "integrating" and "problems." Thus, the question serves the purpose of revealing the existence of semantical confusions, but does not really provide the comprehensive list of themes and focal points expected. An alternative is to list a series of integrating concepts, including a category for "other," and let the respondent indicate the "extent" of their use.

Question 14. In Question 14 many people circled more than one answer. Question 14 should be rewritten to require the respondent to rate the primary audience in priority order, 1-7.

Questions 10, 17, 18, 21, 23, and 27. These are all open-ended questions. They are included primarily to identify themes or to identify horizontal and vertical linkages and interactions within environmental education. These questions were necessary to the survey and were productive of excellent information. However, it must be recognized that open-ended questions often lead to open-ended answers. Thus, considerable time must be devoted to coding, editing, and clarification of the answers. Other users might find it appropriate, depending upon their goals, to eliminate or alter some or all of these questions.

An inevitable product of a questionnaire of this type is that it may develop certain self-serving attributes. In this questionnaire, we felt it was necessary to define environmental education in order to procure a realistic response. The presence of the definition, however, may thereafter shade the nature of the responses. This probably means that more respondents leaned toward the integrative and interrelationship themes than might have if the definition had not been present. On the other hand, if the definition is not included, the survey becomes more of a perception testing instrument and some portion of the respondents (who are in fact involved in environmental education) would not have replied.

APPENDIX E

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BIBLIOGRAPHY

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